Patent File History

10,225,588

Doc Code: TRACK1.REQ
Document Description: TrackOne Request

PTO/AIA/424 (04-14)

CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)

First Named Inventor:	Michael George Kiefer	Nonprovisional Application Number (if known):	
Title of Invention:	PLAYBACK DEVICES AND METHODS FOR PLAYING BACK ALTERNATIVE STREAMS OF CONTENT PROTECTED USING A COMMON SET OF CRYPTOGRAPHIC KEYS		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently $0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.

2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.

3. The applicable box is checked below:

I. ☑ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, **or** the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

i. A request for continued examination has been filed with, or prior to, this form.
ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /David J. Bailey/	Date 09/19/2018
Name (Print/Typed) David J. Bailey	Practitioner Registration Number 59,632

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.**

☑ *Total of 1 forms are submitted.

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	D1-02359A.CON5
	Application Number	
Title of Invention	PLAYBACK DEVICES AND METHODS FOR PLAYING BACK ALTERNATIVE STREAMS OF CONTENT PROTECTED USING A COMMON SET OF CRYPTOGRAPHIC KEYS	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Michael	George	Kiefer	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Lake Havasu City	State/Province	AZ	Country of Residence	US

Mailing Address of Inventor:

Address 1	470 Brite Drive		
Address 2			
City	Lake Havasu City	State/Province	AZ
Postal Code	86406	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Eric	William	Grab	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	San Diego	State/Province	CA	Country of Residence	US

Mailing Address of Inventor:

Address 1	5387 Channing Street		
Address 2			
City	San Diego	State/Province	CA
Postal Code	92117	Country	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Jason		Braness	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

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Title of Invention	PLAYBACK DEVICES AND METHODS FOR PLAYING BACK ALTERNATIVE STREAMS OF CONTENT PROTECTED USING A COMMON SET OF CRYPTOGRAPHIC KEYS	

City	San Diego	State/Province	CA	Country of Residence	US

Mailing Address of Inventor:

Address 1	15659 S. Chevy Chase		
Address 2			
City	San Diego	State/Province	CA
Postal Code	92127	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	71897		
Email Address	pair@kppb.com	Add Email	Remove Email

Application Information:

Title of the Invention	PLAYBACK DEVICES AND METHODS FOR PLAYING BACK ALTERNATIVE STREAMS OF CONTENT PROTECTED USING A COMMON SET OF CRYPTOGRAPHIC KEYS		
Attorney Docket Number	D1-02359A.CON5	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	19	Suggested Figure for Publication (if any)	1

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

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Title of Invention	PLAYBACK DEVICES AND METHODS FOR PLAYING BACK ALTERNATIVE STREAMS OF CONTENT PROTECTED USING A COMMON SET OF CRYPTOGRAPHIC KEYS	

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	71897		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	15/481340	2017-04-06

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15/481340	Continuation of	14/970412	2015-12-15	9621522	2017-04-11

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14/970412	Continuation of	14/564003	2014-12-08	9247311	2016-01-26

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14/564003	Continuation of	13/340623	2011-12-29	8909922	2014-12-09

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
13/340623	Claims benefit of provisional	61/530305	2011-09-01

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

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	Application Number	
Title of Invention	PLAYBACK DEVICES AND METHODS FOR PLAYING BACK ALTERNATIVE STREAMS OF CONTENT PROTECTED USING A COMMON SET OF CRYPTOGRAPHIC KEYS	

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	D1-02359A.CON5
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Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	D1-02359A.CON5
	Application Number	
Title of Invention	PLAYBACK DEVICES AND METHODS FOR PLAYING BACK ALTERNATIVE STREAMS OF CONTENT PROTECTED USING A COMMON SET OF CRYPTOGRAPHIC KEYS	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	DIVX, LLC		
Mailing Address Information For Applicant:			
Address 1	4350 La Jolla Village Drive		
Address 2	Suite 950		
City	San Diego	**State/Province**	CA
Country	US	Postal Code	92122
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	D1-02359A.CON5
	Application Number	
Title of Invention	PLAYBACK DEVICES AND METHODS FOR PLAYING BACK ALTERNATIVE STREAMS OF CONTENT PROTECTED USING A COMMON SET OF CRYPTOGRAPHIC KEYS	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☒

Organization Name	DIVX, LLC

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	4350 La Jolla Village Drive		
Address 2	Suite 950		
City	San Diego	**State/Province**	CA
Country i	US	Postal Code	92122
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/David J. Bailey/			Date (YYYY-MM-DD)	2018-09-19
First Name	David	Last Name	Bailey	Registration Number	59,632

Additional Signature may be generated within this form by selecting the Add button.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	D1-02359A.CON5
	Application Number	
Title of Invention	PLAYBACK DEVICES AND METHODS FOR PLAYING BACK ALTERNATIVE STREAMS OF CONTENT PROTECTED USING A COMMON SET OF CRYPTOGRAPHIC KEYS	

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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.**

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	SYSTEMS AND METHODS FOR PLAYING BACK ALTERNATIVE STREAMS OF PROTECTED CONTENT PROTECTED USING COMMON CRYPTOGRAPHIC INFORMATION

As the below named inventor, I hereby declare that:

This declaration is directed to:

- ☐ The attached application, or
- ☑ United States application or PCT international application number 14/564,003 filed on December 8, 2014

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Michael George Kiefer Date (Optional): 12/14/2015

Signature: /Michael George Kiefer/

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1.11 and 1.14. This collection is estimated to take 1 minute 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.

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	SYSTEMS AND METHODS FOR PLAYING BACK ALTERNATIVE STREAMS OF PROTECTED CONTENT PROTECTED USING COMMON CRYPTOGRAPHIC INFORMATION

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☑ United States application or PCT international application number 14/564,003

filed on December 8, 2014

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Eric William Grab Date (Optional):

Signature:

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/AIA01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1.11 and 1.14. This collection is estimated to take 1 minute 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.

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	SYSTEMS AND METHODS FOR PLAYING BACK ALTERNATIVE STREAMS OF PROTECTED CONTENT PROTECTED USING COMMON CRYPTOGRAPHIC INFORMATION

As the below named inventor, I hereby declare that:

This declaration is directed to:

- ☐ The attached application, or
- ☑ United States application or PCT international application number 14/564,003 filed on December 8, 2014

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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LEGAL NAME OF INVENTOR

Inventor: Jason Braness Date (Optional):

Signature:

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PLAYBACK DEVICES AND METHODS FOR PLAYING BACK ALTERNATIVE STREAMS OF CONTENT PROTECTED USING A COMMON SET OF CRYPTOGRAPHIC KEYS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The current application is a continuation of U.S. Patent Application Serial No. 15/481,340, filed April 6, 2017, entitled "Systems and Methods for Playing Back Alternative Streams of Protected Content Protected Using Common Cryptographic Information" to Kiefer et al., which application is a continuation of U.S. Patent Application Serial No. 14/970,412, filed December 15, 2015, entitled "Systems and Methods for Playing Back Alternative Streams of Protected Content Protected Using Common Cryptographic Information" to Kiefer et al., which is a continuation of U.S. Patent Application Serial No. 14/564,003, filed December 8, 2014 and issued on January 26, 2016 as U.S. Patent No. 9,247,311, entitled "Systems and Methods for Playing Back Alternative Streams of Protected Content Protected Using Common Cryptographic Information" to Kiefer et al., which application is a continuation of U.S. Patent Application Serial No. 13/340,623, filed December 29, 2011 and issued on December 9, 2014 as U.S. Patent No. 8,909,922, entitled "Systems and Methods for Playing Back Alternative Streams of Protected Content Protected Using Common Cryptographic Information" to Kiefer et al., which application claims priority under 35 U.S.C. § 119(e) to U.S. Provisional Application Serial No. 61/530,305 filed September 1, 2011, entitled "Multi-Asset Protected Content Multimedia Delivery System", the disclosures of which are expressly incorporated by reference herein in their entirety.

FIELD OF THE INVENTION

[0002] The present invention generally relates to adaptive streaming and more specifically to adaptive bitrate streaming of encoded media contained within Matroska container files using Hypertext Transfer Protocol.

BACKGROUND

[0003] The term streaming media describes the playback of media on a playback device, where the media is stored on a server and continuously sent to the playback

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device over a network during playback. Typically, the playback device stores a sufficient quantity of media in a buffer at any given time during playback to prevent disruption of playback due to the playback device completing playback of all the buffered media prior to receipt of the next portion of media. In many instances, content is divided into multiple streams. For example, content can be divided into audio, video, and subtitle streams and some streams can be encoded as alternative streams that are suitable for different network connection bandwidths or comply with specific geographic restrictions and/or other restrictions.

[0004] Adaptive bit rate streaming or adaptive streaming involves detecting the present streaming conditions (e.g. the user's network bandwidth and CPU capacity) in real time and adjusting the quality of the streamed media accordingly by selecting between different streams encoded for use at different network connection data rates. Typically, the source media is encoded at multiple bitrates and the playback device or client switches between streaming the different encodings depending on available resources.

[0005] Adaptive streaming solutions typically utilize either Hypertext Transfer Protocol (HTTP), published by the Internet Engineering Task Force and the World Wide Web Consortium as RFC 2616 to stream media between a server and a playback device. HTTP is a stateless protocol that enables a playback device to request a byte range within a file. HTTP is described as stateless, because the server is not required to record information concerning the state of the playback device requesting information or the byte ranges requested by the playback device in order to respond to requests received from the playback device.

[0006] In adaptive streaming systems, the source media is typically stored on a media server as a top level index file pointing to a number of alternate streams that contain the actual video and audio data. Each stream is typically stored in one or more container files. Different adaptive streaming solutions typically utilize different index and media containers. The Synchronized Multimedia Integration Language (SMIL) developed by the World Wide Web Consortium is utilized to create indexes in several adaptive streaming solutions including IIS Smooth Streaming developed by Microsoft

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Corporation of Redmond, Washington, and Flash Dynamic Streaming developed by Adobe Systems Incorporated of San Jose, California. HTTP Adaptive Bitrate Streaming developed by Apple Computer Incorporated of Cupertino, California implements index files using an extended M3U playlist file (.M3U8), which is a text file containing a list of URIs that typically identify a media container file. The most commonly used media container formats are the MP4 container format specified in MPEG-4 Part 14 (i.e. ISO/IEC 14496-14) and the MPEG transport stream (TS) container specified in MPEG-2 Part 1 (i.e. ISO/IEC Standard 13818-1). The MP4 container format is utilized in IIS Smooth Streaming and Flash Dynamic Streaming. The TS container is used in HTTP Adaptive Bitrate Streaming.

[0007] The Matroska container is a media container developed as an open standard project by the Matroska non-profit organization of Aussonne, France. The Matroska container is based upon Extensible Binary Meta Language (EBML), which is a binary derivative of the Extensible Markup Language (XML). Decoding of the Matroska container is supported by many consumer electronics (CE) devices. The DivX Plus file format developed by DivX, LLC of San Diego, California utilizes an extension of the Matroska container format (i.e. is based upon the Matroska container format, but includes elements that are not specified within the Matroska format).

[0008] The term Digital Rights Management (DRM) is utilized to describe access control technologies that are used to control access to and/or copying of digital content. DRM systems typically involve the use of cryptographic information to control access to or protect a piece of content. Content protection is typically achieved using cryptographic information such as (but not limited to) one or more encryption keys to encrypt some or all of the content. An important component of most DRM systems is a mechanism for securely providing cryptographic information to authorized playback devices for use in accessing protected content. The protected content cannot be accessed without the cryptographic data and ideally the cryptographic data is bound to specific playback devices and cannot be readily used by unauthorized playback devices or is securely provided to the playback devices (often on a session basis).

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SUMMARY OF THE INVENTION

[0009] Systems and methods in accordance with embodiments of the invention perform adaptive bitrate streaming using alternative streams of protected content. One embodiment of the invention includes a processor, and memory containing a client application. In addition, the client application configures the processor to: request a top level index file identifying a plurality of alternative streams of protected content, where each of the alternative streams of protected content are encrypted using common cryptographic information; obtain the common cryptographic information; request portions of content from at least the plurality of alternative streams of protected content; access the protected content using the common cryptographic information; and playback the content.

[0010] In a further embodiment, the alternative streams of protected content are alternative streams of protected video, each of the alternative streams of protected video includes DRM information indicating portions of frames of video that are encrypted and identifying at least a portion of the common cryptographic information used to access the encrypted portions of the frames of video, and the client application configures the processor to: obtain a protected frame of video from one of the alternative streams of protected video; obtain DRM information indicating a portion of the protected frame of video that is encrypted; identify at least a portion of the common cryptographic information that is used to access the encrypted portion of the protected frame using the DRM information; decrypt the encrypted portion of the protected frame of video using the identified portion of the common cryptographic information; and decode the frame of video.

[0011] In another embodiment, each of the alternative streams of protected content is contained within a separate container file, and the top level index file identifies a container file containing each of the alternative streams.

[0012] In still further embodiment, the container files containing each of the alternative streams of protected content includes at least one header including the common cryptographic information and information that describes the encoding of the

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stream of protected content, and the top level index file identifies the location of the at least one header within each container file.

[0013] In still another embodiment, the common cryptographic information is a set of encryption keys.

[0014] In a yet further embodiment, the common set of encryption keys is encrypted; and the client application configures the processor to securely receive cryptographic information used to unencrypt the common set of encryption keys.

[0015] In yet another embodiment, 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.

[0016] In a further embodiment again, each container file containing one of the alternative streams of protected content further includes 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.

[0017] In another embodiment again, the container files are Matroska container files.

[0018] In a further additional embodiment, 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.

[0019] In another additional embodiment, the common cryptographic information is a set of encryption keys; and the set of encryption keys is encrypted and stored within the DRM Header element.

[0020] In a still yet further embodiment, the client application configures the processor to: obtain cryptographic information that can be used to unencrypt the set of encryption keys stored within the DRM Header element; and unencrypt the set of encryption keys stored within the DRM Header element using the obtained cryptographic information.

[0021] In still yet another embodiment, 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.

[0022] In a still further embodiment again, each Mastroska container file containing an alternative stream of protected content further includes 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.

[0023] In still another embodiment again, the index includes a plurality of CueTrackPosition elements that identify the location of a plurality of Cluster elements within the Matroska container file.

[0024] In a still further additional embodiment, each Cluster element contains a plurality of BlockGroup elements including encoded portions of content, a CueTrack Position element indexes each Cluster element, and each CueTrackPosition element includes the size of the Cluster element that it indexes.

[0025] In still another additional embodiment, the alternative streams of protected content are alternative streams of protected video, each of the Matroska container files containing an alternative stream of protected video includes a DRMInfo element in a BlockGroup element containing a protected frame of video, where the DRMInfo element indicates at least a portion of the protected frames of video that is encrypted and identifies at least a portion of the common cryptographic information used to access the at least one encrypted portion of the protected frame of video, and the client application configures the processor to access video frames in a stream of protected video using the common cryptographic information by configuring the processor to: obtain a BlockGroup containing a protected frame of video; parse the BlockGroup element to obtain a DRMInfo element indicating at least a portion of the protected frame of video

that is encrypted using an encryption key from the set of encryption keys; decrypt the at least one encrypted portion of the protected frame of video using the identified encryption key; and decode the frame of video.

[0026] An embodiment of the method of the invention includes requesting a top level index file identifying a plurality of alternative streams of protected content using a playback device, where each of the alternative streams of protected content are encrypted using common cryptographic information, obtaining the common cryptographic information using the playback device, requesting portions of content from at least the plurality of alternative streams of protected content using the playback device, accessing the protected content using the playback device and the common cryptographic information, and playing back the content using the playback device.

[0027] In a further embodiment of the method of the invention, the alternative streams of protected content are alternative streams of protected video, each of the alternative streams of protected video includes DRM information indicating portions of frames of video that are encrypted and identifying at least a portion of the common cryptographic information used to access the encrypted portions of the frames of video, and the method further includes obtaining a protected frame of video from one of the alternative streams of protected video using the playback device, obtaining DRM information indicating a portion of the protected frame of video that is encrypted using the playback device, identify at least a portion of the common cryptographic information that is used to access the encrypted portion of the protected frame using the playback device and the DRM information, decrypting the encrypted portion of the protected frame of video using the playback device and the identified portion of the common cryptographic information, and decoding the frame of video using the playback device.

[0028] In another embodiment of the method of the invention, each of the alternative streams of protected content is contained within a separate container file, and the top level index file identifies a container file containing each of the alternative streams.

[0029] In a still further embodiment of the method of the invention, the container files containing each of the alternative streams of protected content include at least one header including the common cryptographic information and information that describes

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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.

[0030] In still another embodiment of the method of the invention, the common cryptographic information is a set of encryption keys.

[0031] In a yet further embodiment of the method of the invention, the set of encryption keys is encrypted so that it is accessible using cryptographic information obtained by the playback device, and the method further comprising obtaining cryptographic information using the playback device.

[0032] In yet another embodiment of the method of the invention, the set of encryption keys is encrypted using at least one encryption key, and the playback device securely obtains the at least one encryption key.

[0033] In a further embodiment again of the method of the invention, the at least one encryption key is encrypted using at least one encryption key included in the cryptographic information bound to the playback device.

[0034] Another embodiment again of the method of the invention also includes obtaining the common cryptographic information by requesting at least one header of a container file identified in the top level index file using the playback device.

[0035] In a further additional embodiment of the method of the invention, each container file containing one of the alternative streams of protected content further includes an index, and the method further includes: requesting at least a portion of an index from the container file using the playback device; identify the portion of the container file containing a specific portion of content using the playback device and the index; and requesting the identified portion of the container file using the playback device.

[0036] In another additional embodiment of the method of the invention, the container files are Matroska container files.

[0037] In a still yet further embodiment of the method of the invention, 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.

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[0038] In still yet another embodiment of the method of the invention, the common cryptographic information is a set of encryption keys, and the set of encryption keys is encrypted and stored within the DRM Header element.

[0039] In a still further embodiment again of the method of the invention, the set of encryption keys is encrypted so that it is accessible using cryptographic information obtained by the playback device, and the method further comprising obtaining cryptographic information using the playback device.

[0040] Still another embodiment again of the method of the invention also includes obtaining the DRM Header element by requesting a Tracks element from one of the Matroska container files identified in the top level index file.

[0041] In a still further additional embodiment of the method of the invention, each Mastroska container file containing an alternative stream of protected content further includes an index contained within a Cues element, and the method further includes: requesting at least a portion of a Cues element from a Matroska container file containing one of the alternative streams of protected content using the playback device; identifying a portion of the Matroska container file containing a specific portion of content using the playback device and at least one CueTrackPosition element within the Cues element; and requesting the portion of the Matroska container file identified by the at least one CueTrackPosition element.

[0042] In still another additional embodiment of the method of the invention, the index includes a plurality of CueTrackPosition elements that identify the location of a plurality of Cluster elements within the Matroska container file.

[0043] In a yet further embodiment again of the method of the invention, each Cluster element contains a plurality of BlockGroup elements including encoded portions of content, a CueTrack Position element indexes each Cluster element, and each CueTrackPosition element includes the size of the Cluster element that it indexes.

[0044] In yet another embodiment again of the method of the invention, the alternative streams of protected content are alternative streams of protected video, each of the Matroska container files containing an alternative stream of protected video includes a DRMInfo element in a BlockGroup element containing a protected frame of

video, where the DRMInfo element indicates at least a portion of the protected frames of video that is encrypted and identifies at least a portion of the common cryptographic information used to access the at least one encrypted portion of the protected frame of video, and the method further includes: obtaining a BlockGroup containing a protected frame of video using the playback device; parsing the BlockGroup element to obtain a DRMInfo element indicating at least a portion of the protected frame of video that is encrypted using the playback device and an encryption key from the set of encryption keys; decrypting the at least one encrypted portion of the protected frame of video using the playback device and the identified encryption key; and decoding the frame of video using the playback device.

[0045] Another further embodiment includes a machine readable medium containing processor instructions, where execution of the instructions by a processor causes the processor to perform a process including request a top level index file identifying a plurality of alternative streams of protected content, where each of the alternative streams of protected content are encrypted using common cryptographic information, obtaining the common cryptographic information, requesting portions of content from at least the plurality of alternative streams of protected content, accessing the protected content using the common cryptographic information, and playing back the content.

[0046] In still another further embodiment, the alternative streams of protected content are alternative streams of protected video, each of the alternative streams of protected video includes DRM information indicating portions of frames of video that are encrypted and identifying at least a portion of the common cryptographic information used to access the encrypted portions of the frames of video, and execution of the instructions by a processor also causes the processor to perform a process including: obtaining a protected frame of video from one of the alternative streams of protected video; obtaining DRM information indicating a portion of the protected frame of video that is encrypted; identify at least a portion of the common cryptographic information that is used to access the encrypted portion of the protected frame using the DRM information; decrypting the encrypted portion of the protected frame of video using and

the identified portion of the common cryptographic information; and decoding the frame of video.

[0047] In yet another further embodiment, the machine readable medium is non-volatile memory.

BRIEF DESCRIPTION OF THE DRAWINGS

[0048] FIG. 1A is a network diagram of an adaptive bitrate streaming system in accordance with an embodiment of the invention.

[0049] FIG. 1B is a block diagram illustrating a source encoder in accordance with an embodiment of the invention.

[0050] FIG. 1C is a block diagram illustrating a content distribution server in accordance with an embodiment of the invention.

[0051] FIG. 1D is a block diagram illustrating a playback device in accordance with an embodiment of the invention.

[0052] FIG. 2 conceptually illustrates a top level index file and Matroska container files generated by the encoding of source media in accordance with embodiments of the invention.

[0053] FIG. 3 conceptually illustrates a specialized Matroska container file incorporating a TracksData Payload containing cryptographic information in accordance with an embodiment of the invention.

[0054] FIGS. 4a – 4c conceptually illustrate the insertion of different types of protected media into the Clusters element of a Matroska container file subject to various constraints that facilitate adaptive bitrate streaming in accordance with embodiments of the invention.

[0055] FIG. 4d conceptually illustrates the multiplexing of different types of protected media into the Clusters element of a Matroska container file subject to various constraints that facilitate adaptive bitrate streaming in accordance with an embodiment of the invention.

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[0056] FIG. 4e conceptually illustrates the inclusion of a protected trick play track into the Clusters element of a Matroska container file subject to various constraints that facilitate adaptive bitrate streaming in accordance with an embodiment of the invention.

[0057] FIG. 5 conceptually illustrates a modified Cues element of a specialized Matroska container file, where the Cues element includes information enabling the retrieval of Cluster elements using HTTP byte range requests in accordance with an embodiment of the invention.

[0058] FIG. 5a conceptually illustrates a modified Cues element of a specialized Matroska container file in accordance with an embodiment of the invention, where the Cues element is similar to the Cues element shown in FIG. 5 with the exception that attributes that are not utilized during adaptive bitrate streaming are removed.

[0059] FIG. 6 conceptually illustrates the indexing of Cluster elements within a specialized Matroska container file utilizing modified CuePoint elements within the container file in accordance with embodiments of the invention.

[0060] FIG. 7 conceptually illustrates the use of a hierarchical index to index CuePoint elements within a Matroska container file in accordance with embodiments of the invention.

[0061] FIG. 8 is a flow chart illustrating a process for encoding and protecting source media for adaptive bitrate streaming in accordance with an embodiment of the invention.

[0062] FIG. 9 is a flow chart illustrating a process for encoding and encrypting frames of source video in accordance with an embodiment of the invention.

[0063] FIG. 10 conceptually illustrates a DRM header element that can be included in a Matroska container file in accordance with an embodiment of the invention.

[0064] FIG. 11 conceptually illustrates communication between a playback device and an HTTP server associated with the commencement of streaming of encoded media contained within Matroska container files indexed by a top level index file in accordance with an embodiment of the invention.

[0065] FIGS. 12a and 12b conceptually illustrate communication between a playback device and an HTTP server associated with switching between streams in response to

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the streaming conditions experienced by the playback device prior to the decision to switch streams in accordance with embodiments of the invention.

DETAILED DISCLOSURE OF THE INVENTION

[0066] Turning now to the drawings, systems and methods for performing adaptive bitrate streaming using alternative streams of protected content in accordance with embodiments of the invention are illustrated. In a number of embodiments, source media is encoded as a number of alternative streams and the alternative streams are protected using a common set of cryptographic information. In many embodiments, the alternative streams are video streams and each stream is protected by encrypting at least a portion of a plurality of video frames within the stream using the common set of cryptographic information. In several embodiments, the common set of cryptographic information is a set of frame keys. In order to protect a video frame, a frame key can be selected from the set of frame keys and used to encrypt at least a portion of the encoded frame and DRM information can be provided with the protected frame indicating the frame key utilized to perform the encryption and the location of the encrypted portion within the frame. By encrypting each of the alternative streams using the same set of cryptographic information, a playback device can switch between streams without the need to maintain or acquire multiple sets of cryptographic information in memory or to reinitialize the decryption engine of the playback device with a different set of cryptographic information.

[0067] In many embodiments, each of the alternative streams is stored in a separate container file referenced by a top level index file. In several embodiments, the common cryptographic information is embedded in each of the container files so that a playback device has access to the cryptographic information irrespective of which alternative is initially select to commence playback of the media. The common cryptographic information can be stored on a content distribution system and associated with a title identifier or title ID that uniquely identifies the source content used to create the alternative streams. When a new alternative stream is generated, a source encoder can utilize the title ID to request the common cryptographic information from the content

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distribution system and the common cryptographic information can be utilized to encrypt the new alternative stream and embedded in a container file created to contain the new encrypted alternative stream.

[0068] In several embodiments, each stream associated with a piece of source content and/or title ID is stored in a Matroska (MKV) container file. In many embodiments, the Matroska container file is a specialized Matroska container file in that the manner in which the media in each stream is encoded and stored within the container is constrained to improve streaming performance. In several embodiments, the Matroska container file is further specialized in that additional DRM elements (i.e. elements that are not specified as part of the Matroska container format) can be included within the file to facilitate the distribution of protected media during adaptive bitrate streaming. In a number of embodiments, common cryptographic information is included within a DRM header element in each of the Matroska container files and references to the common cryptographic information are made using DRMInfo elements within a BlockGroup element corresponding to a specific frame of encrypted video. In other embodiments, any of a variety of mechanisms can be utilized to store DRM information within a Matroska container in accordance with embodiments of the invention. In several embodiments, each stream (i.e. audio, video, or subtitle) is stored within a separate Matroska container file. In other embodiments, an encoded video stream is multiplexed with one or more encoded audio, and/or subtitle streams in each Matroska container file.

[0069] A top level index file containing an index to the streams contained within each of the container files is also generated to enable adaptive bitrate streaming of the encoded media. In many embodiments, the top level index file is a Synchronized Multimedia Integration Language (SMIL) file containing URIs for each of the Matroska container files. In other embodiments, any of a variety of file formats can be utilized in the generation of the top level index file.

[0070] The performance of an adaptive bitstrate streaming system in accordance with embodiments of the invention can be significantly enhanced by encoding each portion of the source video at each bit rate in such a way that the portion of video is

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encoded in each stream as a single (or at least one) closed group of pictures (GOP) starting with an Instantaneous Decoder Refresh (IDR) frame. The GOP for each stream can then be stored as a Cluster element within the Matroska container file for the stream. In this way, the playback device can switch between streams at the completion of the playback of a Cluster and, irrespective of the stream from which a Cluster is obtained the first frame in the Cluster will be an IDR frame and can be decoded without reference to any encoded media other than the encoded media contained within the Cluster element. In many embodiments, the sections of the source video that are encoded as GOPs are all the same duration. In a number of embodiments each two second sequence of the source video is encoded as a GOP.

[0071] Adaptive streaming of source media encoded in the manner outlined above can be coordinated by a playback device in accordance with embodiments of the invention. The playback device obtains information concerning each of the available streams from the top level index file and selects one or more streams to utilize in the playback of the media. The playback device can then obtain header information from the Matroska container files containing the one or more bitstreams or streams, and the headers provide information concerning the decoding of the streams including a DRM header, which contains the cryptographic information utilized to protect the stream. The playback device can also request index information that indexes the encoded media stored within the relevant Matroska container files. The index information can be stored within the Matroska container files or separately from the Matroska container files in the top level index or in separate index files. The index information enables the playback device to request byte ranges corresponding to Cluster elements within the Matroska container file containing specific portions of encoded media via HTTP from the server. As the playback device receives the Cluster elements from the HTTP server, the playback device can evaluate current streaming conditions to determine whether to increase or decrease the bitrate of the streamed media. In the event that the playback device determines that a change in bitrate is necessary, the playback device can obtain header information and index information for the container file(s) containing the desired stream(s) (assuming the playback device has not already obtained this information).

The playback device need not perform the computationally intensive process of accessing the encrypted cryptographic information in the header of the new stream, because each of the alternative streams uses common cryptographic information. The index information can then be used to identify the byte range of the Cluster element containing the next portion of the source media encoded at the desired bit rate and the identified Cluster element can be retrieved from the server via HTTP. The next portion of the source media that is requested is typically identified based upon the Cluster elements already requested by the playback device and the Cluster elements buffered by the playback device. The next portion of source media requested from the alternative stream is requested to minimize the likelihood that the buffer of the playback device will underflow (i.e. run out media to playback) prior to receipt of the Cluster element containing the next portion of source media by the playback device. In this way, the playback device can achieve adaptive bitrate streaming by retrieving sequential Cluster elements from the various streams as appropriate to the streaming conditions using the top level index and index information describing the Cluster elements within each of the Matroska container files.

[0072] In a number of embodiments, variation in the bitrate between different streams can be achieved by modifying the encoding parameters for each stream including but not limited to the bitrate, frame rate, resolution and sample aspect ratio. The encoding and protection of source video using common cryptographic information for use in adaptive bitrate streaming and the playback of alternative streams of protected content via adaptive bitrate streaming in accordance with embodiments of the invention is discussed further below.

ADAPTIVE STREAMING SYSTEM ARCHITECTURE

[0073] An adaptive bitrate streaming system in accordance with an embodiment of the invention is illustrated in FIG. 1. The adaptive streaming system 10 includes a source encoder 12 configured to encode source media as a number of alternative streams and to protect the encoded streams using common cryptographic information. Alternative streams are streams that encode the same media content in different ways.

In several embodiments, the source encoder 12 ingests source content and obtains a title ID and common cryptographic information from a content distribution server 14 that the content distribution server assigns to the source content. The source encoder encodes the alternative streams and protects the streams using the common cryptographic information received from the content distribution server. In many instances, alternative streams encode media content (such as but not limited to video) at different maximum bitrates. In a number of embodiments, the alternative streams are encoded with different resolutions, sample aspect ratios and/or frame rates. When the streams are written to file(s), the common cryptographic information is also written to the file(s). The content distribution server 14 can receive request to access the alternative streams of content (i.e. the title) via the Internet from a playback device such as (but not limited to) a user computer 18 or a mobile phone 20 and can commence streaming content. In several embodiments, the common cryptographic information is protected by encrypting at least a portion of the common cryptographic information using at least one encryption key. The playback device can securely obtain the cryptographic key using a process such as (but not limited to) Hypertext Transfer Protocol Secure or HTTPS. Other processes for securely obtaining cryptographic information to obtain access to encrypted common cryptographic information in accordance with embodiments of the invention are discussed below.

[0074] In many embodiments, a playback device commences playback by requesting a top level index file from the content distribution server. The source encoder 12, the content distribution server 14, or another server can generate the top level index to the file(s) containing the streams, at least a plurality of which are alternative streams, at the time the request is made or at the time the streams are generated by the source encoder. The playback device can then use HTTP or another appropriate stateless protocol to request portions of the top level index file and the file(s) containing the protected streams via a network 16 such as the Internet.

[0075] In many embodiments, the top level index file is a SMIL file and the media is stored in Matroska container files. As is discussed further below, the media can be stored within the Matroska container file in a way that facilitates the protection of the

content using common cryptographic information. In many embodiments, the Matroska container files are specialized Matroska container files that include enhancements (i.e. elements that do not form part of the Matroska file format specification) that facilitate retrieval and decryption using common cryptographic information of specific portions of media during adaptive bitrate streaming.

[0076] Although a specific content distribution system configured to support adaptive bitrate streaming is illustrated in FIG. 1A, any of a variety of content distribution system architectures can be utilized to implement an adaptive bitrate streaming system in accordance with embodiments of the invention. Source encoders, content distribution server systems, and playback devices in accordance with embodiments of the invention are discussed further below.

SOURCE ENCODERS

[0077] In many embodiments, a source encoder can be implemented using a server. In other embodiments, the source encoder can be any processing device including a processor and sufficient resources to perform the transcoding and encryption of source media (including but not limited to video, audio, and/or subtitles). A source encoder in accordance with an embodiment of the invention is illustrated in FIG. 1B. The source encoder 12 is implemented on a computing platform including a processor 12a, volatile memory 12b and non-volatile storage 12c. An encoder application 12d is stored in non-volatile storage 12c. The encoder application includes the machine readable instructions that configure the processor to encode source content 12e as a plurality of streams. In a number of embodiments, the encoder application also configures the source encoder to obtain common cryptographic information 12g that can be utilized to protect alternative streams generated using the source content 12e. In many embodiments, the source encoder obtains the common cryptographic information and a title ID from a content distribution system. In other embodiments, the source encoder generates a title ID and/or cryptographic data and provides the generated information to a content distribution system.

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[0078] Although a specific source encoder in accordance with embodiments of the invention is illustrated in FIG. 1B, any of a variety of computing platforms can be utilized to implement a source encoder that is configured to encode at least one stream of source content as a plurality of alternative streams and to protect each of the alternative streams using common cryptographic information in accordance with embodiments of the invention.

CONTENT DISTRIBUTION SERVERS

[0079] Content distribution servers in accordance with embodiments of the invention can be responsible for storing protected streams of content for streaming to playback devices using adaptive bitrate streaming processes. Content distribution servers can also store common cryptographic information utilized to protect the alternative streams of protected content. In several embodiments, the common cryptographic information is identified utilizing a title ID associated with the common cryptographic information and a set of streams that form part of a specific title or piece of content. A content distribution server in accordance with an embodiment of the invention is illustrated in FIG. 1C. The content distribution server is implemented using a computing platform including a processor 14a, volatile memory 14b, and non-volatile storage 14c. In the illustrated embodiment, a plurality of container files 14d are stored on the content distribution server. Playback devices can stream content from the content distribution server utilizing adaptive bitrate streaming processes in accordance with embodiments of the invention. To facilitate the creation of new streams with respect to a specific piece of content, the content distribution server also stores title IDs 14e for specific pieces of content and common cryptographic information 14f associated with each title ID. A source encoder can request common cryptographic information to protect a new stream related to a specific piece of content, by providing a request to the content distribution server that identifies the specific piece of content using the title ID assigned to it.

[0080] Although a specific content distribution server is illustrated in FIG. 1C, any of a variety of computational platform including (but not limited to) platforms in which container files and common cryptographic information are stored on separate servers

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can be utilized in content distribution systems in accordance with embodiments of the invention.

PLAYBACK DEVICES

[0081] Referring back to FIG. 1A, the illustrated playback devices include personal computers 18 and mobile phones 20. In other embodiments, playback devices can include consumer electronics devices such as DVD players, Blu-ray players, televisions, set top boxes, video game consoles, tablets, and other devices that are capable of playing back protected media stored on a content distribution server using adaptive bitrate streaming. A playback device in accordance with an embodiment of the invention is illustrated in FIG. 1D. The playback device is implemented on a processing platform 20 including a processor 20a, volatile memory 20b, and non-volatile memory (or other non-volatile storage) 20c. The non-volatile memory 20c contains a client application 20d, which includes machine readable instructions that can be utilized to configure the processor to register with a content distribution system to obtain cryptographic data 20e bound to the playback device. The playback device can then use the bound cryptographic data 20e to request adaptive bitrate streaming of protected content. As is discussed further below, the alternative streams of protected content utilized to perform adaptive bitrate streaming are protected using common cryptographic information. Once the client application 20d has obtained the common cryptographic information, which can be a time consuming and/or computationally intensive process, the playback device can use the same cryptographic information to access content in any of the alternative streams of protected content within a single instance of a title.

[0082] Although a specific architecture for a playback device is shown in FIG. 1D any of a variety of architectures can be utilized that enable playback devices to request portions of the top level index file and the container files in accordance with embodiments of the invention.

FILE STRUCTURE

[0083] Files generated by a source encoder and/or stored on an HTTP server for streaming to playback devices in accordance with embodiments of the invention are

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illustrated in FIG. 2. The files utilized in the adaptive bitrate streaming of the source media include a top level index 30 and a plurality of container files 32 that each contain at least one stream. The top level index file describes the content of each of the container files. As is discussed further below, the top level index file can take a variety of forms including an SMIL file and the container files can take a variety of forms including a specialized Matroska container file.

[0084] In many embodiments, each Matroska container file contains a single protected stream. For example, the stream could be one of a number of alternate video streams protected using common cryptographic information, an audio stream, one of a number of alternate audio streams, a subtitle stream, one of a number of alternate subtitle streams, a trick play stream, or one of a number of alternate trick play streams protected using common cryptographic information. In several embodiments, the Matroska container file includes multiple multiplexed streams. For example, the Matroska container could include a video stream, and one or more audio streams, one or more subtitle streams, and/or one or more trick play streams. As is discussed further below, in many embodiments the Matroska container files are specialized files. The encoding of the media and the manner in which the media is stored within Cluster elements within the Matroska container file can be subject to constraints designed to enhance the performance of an adaptive bitrate streaming system. In a number of embodiments, common cryptographic information is included within a DRM header element in each of the Matroska container files and references to the common cryptographic information are made using DRMInfo elements included within BlockGroup elements of protected (not all frames need be protected to protect the stream). In addition, the Matroska container file can include index elements that facilitate the location and downloading of Cluster elements from the various Matroska container files during the adaptive streaming of the media. Top level index files and Matroska container files that can be used in adaptive bitrate streaming systems in accordance with embodiments of the invention are discussed below.

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TOP LEVEL INDEX FILES

[0085] Playback devices in accordance with many embodiments of the invention utilize a top level index file to identify the container files that contain the streams available to the playback device for use in adaptive bitrate streaming. In many embodiments, the top level index files can include references to container files that each include an alternative stream of encoded media. The playback device can utilize the information in the top level index file to retrieve encoded media from each of the container files according to the streaming conditions experienced by the playback device.

[0086] In several embodiments, the top level index file provides information enabling the playback device to retrieve information concerning the encoding of the media in each of the container files and an index to encoded media within each of the container files. In a number of embodiments, each container file includes information concerning the encoded media contained within the container file and an index to the encoded media within the container file and the top level index file indicates the portions of each container file containing this information. Therefore, a playback device can retrieve the top level index file and use the top level index file to request the portions of one or more of the container files that include information concerning the encoded media contained within the container file and an index to the encoded media within the container file. A variety of top level index files that can be utilized in adaptive bitrate streaming systems in accordance with embodiments of the invention are discussed further below.

[0087] In a number of embodiments, the top level index file utilized in the adaptive bitrate streaming of media is a SMIL file, which is an XML file that includes a list of URIs describing each of the streams and the container files that contain the streams. The URI can include information such as the "system-bitrate" of the stream contained within the stream and information concerning the location of specific pieces of data within the container file. The top level index SMIL file can be generated when the source media is encoded for playback via adaptive bitrate streaming. Alternatively, the top level index SMIL file can be generated when a playback device requests the commencement of playback of the encoded media. When the playback device receives the top level index

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SMIL file, the playback device can parse the SMIL file to identify the available streams. The playback device can then select the streams to utilize to playback the content and can use the SMIL file to identify the portions of the container file to download to obtain information concerning the encoding of a specific stream and/or to obtain an index to the encoded media within the container file.

[0088] Although top level index SMIL files are described above, any of a variety of top level index file formats can be utilized to create top level index files as appropriate to a specific application in accordance with an embodiment of the invention. The use of top level index files to enable playback of encoded media using adaptive bitrate streaming in accordance with embodiments of the invention is discussed further below.

STORING PROTECTED MEDIA IN MKV FILES FOR ADAPTIVE BITRATE STREAMING

[0089] A Matroska container file used to store encoded video in accordance with an embodiment of the invention is illustrated in FIG. 3. The container file 32 is an Extensible Binary Markup Language (EBML) file that is an extension of the Matroska container file format. The specialized Matroska container file 32 includes a standard EBML element 34, and a standard Segment element 36 that includes a standard Seek Head element 40, a standard Segment Information element 42, and a standard Tracks element 44 including a tracks data payload that is a non-standard EBML element containing cryptographic information utilized to access the protected stream(s) contained within the Matroska container file. In many embodiments, the cryptographic data takes the form of a DRMHeaders element (discussed below) that includes a set of keys utilized to access encrypted portions of the stream contained within the Matroska container file. In many embodiments, the set of keys is encrypted in such a way that a playback device can only access the set of keys in the clear using a specific piece or set of cryptographic information.

[0090] The Segment element 36 also includes a standard Clusters element 46. As is described below, the manner in which encoded media is inserted within individual Cluster elements 48 within the Clusters element 46 is constrained to improve the

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playback of the media in an adaptive streaming system. In many embodiments, the constraints imposed upon the encoded video are consistent with the specification of the Matroska container file format and involve encoding the video so that each cluster includes at least one closed GOP commencing with an IDR frame. In addition to the above elements, the Segment element 36 can optionally include a modified version of the standard Cues element. As is discussed further below, the Cues element includes specialized CuePoint elements (i.e. non-standard CuePoint elements) that facilitate the retrieval of the media contained within specific Cluster elements via HTTP. The Segment element 36 can optionally include a non-standard Hierarchical Index element 54. The Hierarchical Index element is an extension to the Matroska file format proposed by DivX, LLC of San Diego, California. The Hierarchical Index element is described in U.S. Patent Application Serial No. 12/272,631, the disclosure of which is incorporated by reference above in its entirety.

[0091] The constraints imposed upon the encoding of media and the formatting of the encoded media within the Clusters element of a Matroska container file for adaptive bitrate streaming of protected streams and the additional DRM and index information inserted within the container file in accordance with embodiments of the invention are discussed further below.

ENCODING MEDIA FOR INSERTION IN CLUSTER ELEMENTS

[0092] An adaptive bitrate streaming system provides a playback device with the option of selecting between different protected streams of encoded media during playback according to the streaming conditions experienced by the playback device. In many embodiments, switching between protected streams is facilitated by separately pre-encoding discrete portions of the source media in accordance with the encoding parameters of each stream and then including each separately encoded portion in its own Cluster element within the stream's container file. Furthermore, the media contained within each Cluster is encoded so that the media is capable of playback without reference to media contained in any other Cluster within the stream. In this way, each stream includes a Cluster element corresponding to the same discrete

portion of the source media and, at any time, the playback device can select the Cluster element from the stream that is most appropriate to the streaming conditions experienced by the playback device and can commence playback of the media contained within the Cluster element. Accordingly, the playback device can select clusters from different streams as the streaming conditions experienced by the playback device change over time. In several embodiments, the Cluster elements are further constrained so that each Cluster element contains a portion of encoded media from the source media having the same duration. In a number of embodiments, each Cluster element includes two seconds of encoded media. The specific constraints applied to the media encoded within each Cluster element depending upon the type of media (i.e. video, audio, or subtitles) are discussed below.

[0093] A Clusters element of a Matroska container file containing a video stream in accordance with an embodiment of the invention is illustrated in FIG. 4a. The Clusters element 46 includes a plurality of Cluster elements 48 that each contains a discrete portion of encoded video. In the illustrated embodiment, each Cluster element 48 includes two seconds of encoded video. In other embodiments, the Cluster elements include encoded video having a greater or lesser duration than two seconds. In several embodiments, the encoded video sequences in the Cluster elements have different durations.

[0094] Each Cluster element 48 includes a Timecode element 60 indicating the start time of the encoded video within the Cluster element and a plurality of BlockGroup elements. As noted above, the encoded video stored within the Cluster is constrained so that the encoded video can be played back without reference to the encoded video contained within any of the other Cluster elements in the container file. In many embodiments, encoding the video contained within the Cluster element as a GOP in which the first frame is an IDR frame enforces the constraint. In the illustrated embodiment, the first BlockGroup element 62 contains an IDR frame. Therefore, the first BlockGroup element 62 does not include a ReferenceBlock element. The first BlockGroup element 62 includes a Block element 64, which specifies the Timecode attribute of the frame encoded within the Block element 64 relative to the Timecode of

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the Cluster element 48 and a DRMInfo element 65 that identifies a portion of the frame that is encrypted and the cryptographic information that can be utilized to access the encrypted portion of the frame. In a number of embodiments, only a small portion of the video frame is encrypted and the DRMInfo includes a reference to the start of an encrypted block of data and the size of the encrypted block of data. As is discussed further below, the common cryptographic information utilized to protect alternative streams of video content is a set of frame keys in many embodiments of the invention and the DRMInfo element can also include an index to a specific frame key in the set of frame keys that can be utilized to access the encrypted block of data in the clear. In other embodiments, any of a variety of information appropriate to identifying encrypted data within a video frame and decrypting the encrypted data can be stored within a DRMInfo element.

[0095] Subsequent BlockGroup elements 66 are not restricted in the types of frames that they can contain (other than that they cannot reference frames that are not contained within the Cluster element). Therefore, subsequent BlockGroup elements 66 can include ReferenceBlock elements 68 referencing other BlockGroup element(s) utilized in the decoding of the frame contained within the BlockGroup or can contain IDR frames and are similar to the first BlockGroup element 62. In addition, subsequent BlockGroup elements 66 can also include DRMInfo elements to describe the manner in which the frame of video contained within the BlockGroup element is protected. As noted above, the manner in which encoded video is inserted within the Cluster elements of the Matroska file conforms with the specification of the Matroska file format.

[0096] The insertion of encoded audio and subtitle information within a Clusters element 46 of a Matroska container file in accordance with embodiments of the invention is illustrated in FIGS. 4b and 4c. In the illustrated embodiments, the encoded media is inserted within the Cluster elements 48 subject to the same constraints applied to the encoded video discussed above with respect to FIG. 4a. In addition, the duration of the encoded audio and subtitle information within each Cluster element corresponds to the duration of the encoded video in the corresponding Cluster element of the Matroska container file containing the encoded video. In other embodiments, the

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Cluster elements within the container files containing the audio and/or subtitle streams need not correspond with the start time and duration of the Cluster elements in the container files containing the alternative video streams. In many embodiments, audio, and/or subtitle tracks are protected and information identifying the protected portions of the stream can be included in an element in a manner similar to that described above with respect to protected video streams.

MULIPLEXING STREAMS IN A SINGLE MKV CONTAINER FILE

[0097] The Clusters elements shown in FIGS. 4a – 4c assume that a single stream is contained within each Matroska container file. In several embodiments, media from multiple streams is multiplexed within a single Matroska container file. In this way, a single container file can contain a video stream multiplexed with one or more corresponding audio streams, and/or one or more corresponding subtitle streams. Storing the streams in this way can result in duplication of the audio and subtitle streams across multiple alternative video streams. However, the seek time to retrieve encoded media from a video stream and an associated audio, and/or subtitle stream can be reduced due to the adjacent storage of the data on the server. The Clusters element 46 of a Matroska container file containing multiplexed video, audio and subtitle data in accordance with an embodiment of the invention is illustrated in FIG. 4d. In the illustrated embodiment, each Cluster element 48 includes additional BlockGroup elements for each of the multiplexed streams. The first Cluster element includes a first BlockGroup element 62v for encoded video that includes a Block element 64v containing an encoded video frame and indicating the Timecode attribute of the frame relative to the start time of the Cluster element (i.e. the Timecode attribute 60). A second BlockGroup element 62a includes a Block element 64a including an encoded audio sequence and indicating the timecode of the encoded audio relative to the start time of the Cluster element, and a third BlockGroup element 62s including a Block element 64s containing an encoded subtitle and indicating the timecode of the encoded subtitle relative to the start time of the Cluster element. In the illustrated embodiment, only the video stream is protected. Therefore, the BlockGroup elements 62v containing

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the video stream include DRMInfo elements 65v to identify the portions of the frames within the video stream that are encrypted. In other embodiments, the audio, and/or subtitle streams can also be protected. Although not shown in the illustrated embodiment, each Cluster element 48 likely would include additional BlockGroup elements containing additional encoded video, audio or subtitles. Despite the multiplexing of the encoded video, audio, and/or subtitle streams, the same constraints concerning the encoded media apply.

INCORPORATING TRICK PLAY STREAMS IN MKV CONTAINER FILES FOR USE IN ADAPTIVE BITRATE STREAMING SYSTEMS

[0098] The incorporation of trick play tracks within Matroska container files is proposed by DivX, LLC in U.S. Patent Application No. 12/260,404 entitled "Application Enhancement Tracks", filed October 29, 2008, the disclosure of which is hereby incorporated by reference in its entirety. Trick play tracks similar to the trick play tracks described in U.S. Patent Application No. 12/260,404 can be used to provide a trick play stream in an adaptive bitrate streaming system in accordance with an embodiment of the invention to provide smooth visual search through source content encoded for adaptive bitrate streaming. A separate trick play stream can be encoded that appears to be an accelerated visual search through the source media when played back, when in reality the trick play stream is simply a separate stream encoding the source media at a lower frame rate. In several embodiments, a trick play stream is generated in the manner outlined in U.S. Patent Application No. 12/260,404 and inserting the trick play stream into a Matroska container file subject to the constraints mentioned above with respect to insertion of a video stream into a Matroksa container file. In many embodiments, the trick play stream is also subject to the further constraint that every frame in the GOP of each Cluster element in the trick play stream is encoded as an IDR frame. As with the other video streams, each Cluster element contains a GOP corresponding to the same two seconds of source media as the corresponding Cluster elements in the other streams. There are simply fewer frames in the GOPs of the trick play stream and each frame has a longer duration. In this way, transitions to and from a

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trick play stream can be treated in the same way as transitions between any of the other encoded streams are treated within an adaptive bitrate streaming system in accordance with embodiments of the invention. In embodiments where the trick play stream(s) are protected, the same common cryptographic information utilized to encrypt the primary video stream(s) is utilized to protect the trick play stream(s). Playback of the frames contained within the trick play stream to achieve accelerated visual search typically involves the playback device manipulating the timecodes assigned to the frames of encoded video prior to providing the frames to the playback device's decoder to achieve a desired increase in rate of accelerated search (e.g. x2, x4, x6, etc.).

[0099] A Clusters element containing encoded media from a trick play stream is shown in FIG. 4e. In the illustrated embodiment, the encoded trick play stream is inserted within the Cluster elements 48 subject to the same constraints applied to the encoded video discussed above with respect to FIG. 4a including the constraint that frames are protected using the common cryptographic information. However, each BlockGroup element contains an IDR. In other embodiments, the Cluster elements within the container files containing the trick play streams need not correspond with the start time and duration of the Cluster elements in the container files containing the alternative video streams.

[00100] In many embodiments, source content can be encoded to provide a single trick play stream or multiple trick play streams for use by the adaptive bit rate streaming system. When a single trick play stream is provided, the trick play stream is typically encoded at a low bitrate. When multiple alternative trick play streams are provided, adaptive streaming can also be performed with respect to the trick play streams. In several embodiments, multiple trick play streams are provided to support different rates of accelerated visual search through the encoded media.

INCORPORATING INDEXING INFORMATION WITHIN MKV CONTAINER FILES

[00101] The specification for the Matroska container file format provides for an optional Cues element that is used to index Block elements within the container file. A modified Cues element that can be incorporated into a Matroska container file in

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accordance with an embodiment of the invention to facilitate the requesting of clusters by a playback device using HTTP is illustrated in FIG. 5. The Cues element 52 is similar to a standard Cues element 52 in that it includes a plurality of standard CuePoint elements 70 that each include a standard CueTime attribute 72. Each CuePoint element includes a CueTrackPositions element 74 containing the standard CueTrack 76 and CueClusterPosition 78 attributes. In many embodiments, the CuePoint element is mainly configured to identify a specific Cluster element as opposed to a specific Block element within a Cluster element. Although, in several applications the ability to seek to specific Block elements within a Cluster element is required and additional index information is included in the Cues element.

[00102] The use of a modified Cues element to index encoded media within a Clusters element of a Matroska file in accordance with an embodiment of the invention is illustrated in FIG. 6. A CuePoint element is generated to correspond to each Cluster element within the Matroska container file. The CueTime attribute 72 of the CuePoint element 70 corresponds to the Timecode attribute 60 of the corresponding Cluster element 48. In addition, the CuePoint element contains a CueTrackPositions element 74 having a CueClusterPosition attribute 78 that points to the start of the corresponding Cluster element 48. The CueTrackPositions element 74 can also include a CueBlockNumber attribute, which is typically used to indicate the Block element containing the first IDR frame within the Cluster element 48.

[00103] As can readily be appreciated the Cues element 52 forms an index to each of the Cluster elements 48 within the Matroska container file. Furthermore, the CueTrackPosition elements provide information that can be used by a playback device to request the byte range of a specific Cluster element 48 via HTTP or another suitable protocol from a remote server. The Cues element of a conventional Matroska file does not directly provide a playback device with information concerning the number of bytes to request from the start of the Cluster element in order to obtain all of the encoded video contained within the Cluster element. The size of a Cluster element is, therefore, inferred by using the CueClusterPosition attribute of the CueTrackPositions element that indexes the first byte of the next Cluster element. Alternatively, additional

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CueTrackPosition elements could be added that index the last byte of the Cluster element (in addition to the CueTrackPositions elements that index the first byte of the Cluster element), and/or a non-standard CueClusterSize attribute that specifies the size of the Cluster element pointed to by the CueClusterPosition attribute is included in each CueTrackPosition element to assist with the retrieval of specific Cluster elements within a Matroska container file via HTTP byte range requests or a similar protocol.

[00104] The modification of the Cues element in the manner outlined above significantly simplifies the retrieval of Cluster elements from a Matroska container file via HTTP or a similar protocol during adaptive bitrate streaming. In addition, by only indexing the first frame in each Cluster the size of the index is significantly reduced. Given that the index is typically downloaded prior to playback, the reduced size of the Cues element (i.e. index) means that playback can commence more rapidly. Using the CueClusterPosition elements, a playback device can request a specific Cluster element from the stream most suited to the streaming conditions experienced by the playback device by simply referencing the index of the relevant Matroska container file using the Timecode attribute for the desired Cluster element.

[00105] A number of the attributes within the Cues element are not utilized during adaptive bitrate streaming. Therefore, the Cues element can be further modified by removing the unutilized attributes to reduce the overall size of the index for each Matroska container file. A modified Cues element that can be utilized in a Matroska container file that includes a single encoded stream, where portions of the encoded stream having the same duration are contained in each Cluster element within the Matroska file in accordance with an embodiment of the invention is illustrated in FIG. 5a. The Cues element 52' shown in FIG. 5a is similar to the Cues element 52 shown in FIG. 5 with the exception that the CuePoint elements 70' do not include a CueTime attribute (see 72 in FIG. 5) and/or the CueTrackPositions elements 74' do not include a CueTrack attribute (76 in FIG. 5). When the portions of encoded media in each Cluster element in the Matroska container file have the same duration, the CueTime attribute is not necessary. When the Matroska contain file includes a single encoded stream, the CueTrack attribute is not necessary. In other embodiments, the Cues element and/or

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other elements of the Matroska container file can be modified to remove elements and/or attributes that are not necessary for the adaptive bitrate streaming of the encoded stream contained within the Matroska container file, given the manner in which the stream is encoded and inserted in the Matroska container file.

[00106] Although various modifications to the Cues element to include information concerning the size of each of the Cluster elements within a Matroska container file and to eliminate unnecessary attributes are described above, many embodiments of the invention utilize a conventional Matroska container. In several embodiments, the playback device simply determines the size of Cluster elements on the fly using information obtained from a conventional Cues element, and/or relies upon a separate index file containing information concerning the size and/or location of the Cluster elements within the MKV container file. In several embodiments, the additional index information is stored in the top level index file. In a number of embodiments, the additional index information is stored in separate files that are identified in the top level index file. When index information utilized to retrieve Cluster elements from a Matroska container file is stored separately from the container file, the Matroska container file is still typically constrained to encode media for inclusion in the Cluster elements in the manner outlined above. In addition, wherever the index information is located, the index information will typically index each Cluster element and include (but not be limited to) information concerning at least the starting location and, in many instances, the size of each Cluster element.

INCORPORATING HIERARCHICAL INDEXES INTO MKV CONTAINERS

[00107] Retrieval of media using HTTP during adaptive streaming can be improved by adding additional index information to the Matroska container files used to contain each of the encoded streams. In a number of embodiments, the index is a reduced index in that the index only points to the IDRs at the start of each cluster. In many embodiments, the index of the Matroska container file includes additional non-standard attributes (i.e. attributes that do not form part of the Matroska container file format specification) that specify the size of each of the clusters so that a playback device can

retrieve a Cluster element from the Matroska container file via HTTP using a byte range request. In several embodiments, the Matroska container file includes a hierarchical index using a HierarchicalIndex element similar to the hierarchical indexes disclosed in U.S. Patent Application Serial No. 12/272,631 entitled "Hierarchical and Reduced Index Structures for Multimedia Files" to Soroushian et al. filed November 17, 2008 to increase the speed with which a playback device can seek to a specific Cluster element containing encoded media within the container file. The disclosure of U.S. Patent Application Serial No. 12/272,631 is hereby incorporated by reference in its entirety.

[00108] A hierarchical index included in a Matroska container file using a HierarchicalIndex element in accordance with an embodiment of the invention is illustrated in FIG. 7. The HierarchicalIndex element 54 includes a plurality of HierarchicalIndexPointer elements 80 that each point to a CuePoint element 70 within the Cues element 52. In this way, the hierarchical index can be utilized to rapidly locate specific Cluster elements within a Matroska file using the Timecode attribute of the Cluster element. Furthermore, the entire index (i.e. the entire Cues element) need not be downloaded in order to locate a specific Cluster element. The playback device can simply download the hierarchical index and download the specific CuePoint elements that enable the location of a desired Cluster element within the Matroska container file.

[00109] In several embodiments, the HierarchicalIndex element is generated so that the HierarchicalIndexPointer elements point to CuePoint elements indexing Cluster elements that are a predetermined time period apart. For example, the HierarchicalIndexPointer elements can point to CuePoint elements indexing Cluster elements that are spaced 30 seconds apart. In other implementations, any of a variety of implementations can be utilized to determine the interval between the CuePoint elements referenced by the higher layers of the hierarchical index. In addition, although a two layer hierarchical index is illustrated in FIG. 7, hierarchical indexes including three or more layers can also be incorporated within Matroska container files generated for use in adaptive bitrate streaming systems in accordance with embodiments of the invention.

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[00110] As noted above, index information can be stored in a separate file to the Matroska container file in accordance with embodiments of the invention. In embodiments where the index information is stored separately, the index can be hierarchical to prevent the need to download the entire index for a container file prior to playback and to facilitate seeking within the index.

ENCODING AND PROTECTING SOURCE MEDIA FOR ADAPTIVE BITRATE STREAMING

[00111] A process for encoding source media as a top level index file and a plurality of Matroska container files for use in an adaptive bitrate streaming system in accordance with an embodiment of the invention is illustrated in FIG. 8. The encoding process 100 commences by writing headers for each of the MKV files that will contain the streams of content generated using the source content. In the illustrated embodiment, the source content includes a stream of video that is encoded as a plurality of protected streams. The frames of the source video are encoded (104) using the encoding parameters associated with each of the alternative streams and portions of the encoded frames can be encrypted using a frame key selected from a set of frame keys. When the encoding and encryption of the streams is complete, an index is inserted (106) into each Matroska container file containing an alternative stream of protected video. The common set of frame keys is also encrypted (108) and the process writes (110) a DRM header including the encrypted set of frame keys to each container file. DRM headers and processes for restricting access to cryptographic information stored within the DRM header of a Matroska container file in accordance with embodiments of the invention are discussed further below.

[00112] A process for encoding and protecting frames of video to create a plurality of alternative streams of protected video in accordance with embodiments of the invention is illustrated in FIG. 9. The process 120 includes selecting (122) a first portion of the source media and encoding (123) the source media using the encoding parameters for each alternative stream. Assuming that the resulting frame is to be encrypted, a frame key can be selected (124) from a common set of frame keys and utilized to encrypt at

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least a portion of the frame of video. A DRMInfo element can then be written (125) to a BlockGroup element. The DRMInfo element identifies the portion of the frame that is encrypted and the frame key that can be utilized by a playback device to access the encrypted portion of the frame. The encoded and/or encrypted frame can then be written (126) to the BlockGroup element. When the entire source video stream is determined (127) as being encoded and protected, then the process is complete.

[00113] Each portion of source video that is encoded (123) can be encoded as a single GOP commencing with an IDR frame. In many embodiments, encoding parameters used to create the alternative GOPs vary based upon bitrate, frame rate, encoding parameters and resolution. In this way, the portion of media is encoded as a set of interchangeable alternatives and a playback device can select the alternative most appropriate to the streaming conditions experienced by the playback device. When different resolutions are supported, the encoding of the streams is constrained so that each stream has the same display aspect ratio. A constant display aspect ratio can be achieved across different resolution streams by varying the sample aspect ratio with the resolution of the stream. In many instances, reducing resolution can result in higher quality video compared with higher resolution video encoded at the same bit rate.

[00114] Although specific processes involving the encoding and protection of a source video stream as a set of alternative streams are illustrated in FIGS. 8 and 9, any of a variety of processes can be utilized to protect audio, video, and/or subtitle streams using common cryptographic information in accordance with embodiments of the invention. Following the encoding of the source media to create Matroska container files containing each of the protected streams, which can include trick play streams, the Matroska container files can be uploaded to a content distribution server for adaptive bitrate streaming to playback devices. The adaptive bitrate streaming of protected media encoded in accordance with embodiments of the invention using HTTP requests is discussed further below.

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DRM HEADERS

[00115] Common cryptographic information utilized in protecting alternative streams can be inserted into container files containing each of the alternative streams. When the container files are Matroska container files, the common cryptographic information can be inserted into the container file as a DRMHeader element. A DRMHeader element configured to contain a set of keys in accordance with an embodiment of the invention is illustrated in FIG. 10. The DRM Header element 130 includes a plurality of pieces of information 132 including a frame keys record 134 that can be utilized to contain a set of frame keys or frame key table common to each of a plurality of alternative streams.

[00116] If the frame key record 134 is communicated in the clear, then any playback device can access the protected streams. Therefore, the frame keys record 134 is typically encrypted using one or more encryption keys. The encryption key(s) used to encrypt the frame key record 134 can be securely provided to an individual playback device using any of a variety of techniques appropriate to a specific application. In the context of streaming systems that also support the downloading of content.

[00117] Although a specific format for storing common cryptographic information in a Matroska container file is illustrated in FIG. 10, any format can be utilized to store common cryptographic information in a Matroska container file and/or any other container file appropriate to a specific application in accordance with an embodiment of the invention. Adaptive bitrate streaming of protected content in accordance with embodiments of the invention is discussed further below.

ADAPTIVE BITRATE STREAMING FROM MKV CONTAINER FILES USING HTTP

[00118] When source media is encoded so that there are alternative streams of protected media contained in separate Matroska container files for at least one of video, audio, and subtitle content, adaptive streaming of the media contained within the Matroska container files can be achieved using HTTP requests or a similar stateless data transfer protocol. In many embodiments, a playback device requests a top level index file from a content distribution server and uses the index information to identify the

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streams that are available to the playback device and the cryptographic information required to access any protected streams. The playback device can then retrieve the indexes for one or more of the Matroska files and can use the indexes to request media from one or more of the protected streams contained within the Matroska container files using HTTP requests or using a similar stateless protocol. As noted above, many embodiment of the invention implement the indexes for each of the Matroska container files using a modified Cues element. In several embodiments, the index is a hierarchical index and is also includes a HierarchicalIndex element contained within the Matroska container file. In a number of embodiments, however, the encoded media for each stream is contained within a standard Matroska container file and separate index file(s) can also be provided for each of the container files.

[00119] Based upon the streaming conditions experienced by the playback device, the playback device can select media from alternative protected streams encoded at different bitrates. When the media from each of the streams is protected using common cryptographic information and inserted into the Matroska container files in the manner outlined above, transitions between streams can occur upon the completion of playback of media within a Cluster element without the need to retrieve additional cryptographic information. As noted above, the size of the Cluster elements (i.e the duration of the encoded media within the Cluster elements) is typically chosen so that the playback device is able to respond quickly enough to changing streaming conditions and to instructions from the user that involve utilization of a trick play track. The smaller the Cluster elements (i.e. the smaller the duration of the encoded media within each Cluster element) the higher the overhead associated with requesting each Cluster element. Therefore, a tradeoff exists between the responsiveness of the playback device to changes in streaming conditions and the effective data rate of the adaptive streaming system for a given set of streaming conditions (i.e. the portion of the available bandwidth actually utilized to transmit encoded media). In many embodiments, the size of the Cluster elements is chosen so that each Cluster element contains two seconds of encoded media. In other embodiments, the duration of the encoded media can be

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greater or less than two seconds and/or the duration of the encoded media can vary from Cluster element to Cluster element.

[00120] Communication between a playback device or client and an HTTP server during the playback of media encoded in separate streams contained within Matroska container files indexed by a top level index file in accordance with an embodiment of the invention is illustrated in FIG. 11. In the illustrated embodiment, the playback device 200 commences playback by requesting the top level index file from the server 202 using an HTTP request or a similar protocol for retrieving data. The server 202 provides the bytes corresponding to the request. The playback device 200 then parses the top level index file to identify the URIs of each of the Matroska container files containing the streams of encoded media derived from a specific piece of source media. The playback device can then request the byte ranges corresponding to headers of one or more of the Matroska container files via HTTP or a similar protocol, where the byte ranges are determined using the information contained in the URI for the relevant Matroska container files (see discussion above). The server returns the following information in response to a request for the byte range containing the headers of a Matroska container file:

ELEM(“EBML”)
ELEM(“SEEKHEAD”)
ELEM(“SEGMENTINFO”)
ELEM(“TRACKS”)

[00121] The EBML element is typically processed by the playback device to ensure that the file version is supported. The SeekHead element is parsed to find the location of the Matroska index elements and the SegmentInfo element contains two key elements utilized in playback: TimecodeScale and Duration. The TimecodeScale specifies the timecode scale for all timecodes within the Segment of the Matroska container file and the Duration specifies the duration of the Segment based upon the TimecodeScale. The Tracks element contains the information used by the playback device to decode the encoded media contained within the Clusters element of the

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Matroska file including the common cryptographic information, which can take a variety of forms including but not limited to a DRMHeader element. As noted above, adaptive bitrate streaming systems in accordance with embodiments of the invention can support different streams encoded using different encoding parameters including but not limited to frame rate, and resolution. Therefore, the playback device can use the information contained within the Matroska container file's headers to configure the decoder every time a transition is made between encoded streams. Due to the fact that alternative protected streams utilize the same cryptographic information, the engine utilized to decrypt the content on the client 200 (i.e. the software process used to decrypt encrypted portions of frames of video) does not require reconfiguration using different cryptographic information with each stream switch.

[00122] In many embodiments, the playback device does not retrieve the headers for all of the Matroska container files indexed in the top level index file. Instead, the playback device determines the stream(s) that will be utilized to initially commence playback and requests the headers from the corresponding Matroska container files. Depending upon the structure of the URIs contained within the top level index file, the playback device can either use information from the URIs or information from the headers of the Matroska container files to request byte ranges from the server that contain at least a portion of the index from relevant Matroska container files. The byte ranges can correspond to the entire index or can correspond to the top level of a hierarchical index and a portion of a lower level index (i.e. a HierarchicalIndex element and one or more CuePoint elements). The server provides the relevant byte ranges containing the index information to the playback device, and the playback device can use the index information to request the byte ranges of Cluster elements containing encoded media using this information. When the Cluster elements are received, the playback device can extract encoded media from the BlockGroup elements within the Cluster element, and can decode and playback the media within the BlockGroup elements in accordance with their associated Timecode attributes. Prior to decoding the encoded media, the playback device can check for the presence of a DRMInfo element within each BlockGroup of a video stream to identify whether the encoded

media is protected. The playback device can use the information within the DRMInfo element to decrypt encrypted portions of the video prior to decoding.

[00123] In the illustrated embodiment, the playback device 200 requests sufficient index information from the HTTP server prior to the commencement of playback that the playback device can stream the entirety of each of the selected streams using the index information. In other embodiments, the playback device continuously retrieves index information as media is played back. In several embodiments, all of the index information for the lowest bitrate steam is requested prior to playback so that the index information for the lowest bitrate stream is available to the playback device in the event that streaming conditions deteriorate rapidly during playback.

SWITCHING BETWEEN STREAMS

[00124] The communications illustrated in FIG. 11 assume that the playback device continues to request media from the same streams (i.e. Matroska container files) throughout playback of the media. In reality, the streaming conditions experienced by the playback device are likely to change during the playback of the streaming media and the playback device can request media from alternative streams (i.e. different Matroska container files) to provide the best picture quality for the streaming conditions experienced by the playback device. In addition, the playback device may switch streams in order to perform a trick play function that utilizes a trick play track stream.

[00125] Communication between a playback device and a server when a playback device switches to a new stream in accordance with embodiments of the invention are illustrated in FIG. 12a. The communications illustrated in FIG. 12a assume that the index information for the new stream has not been previously requested by the playback device and that downloading of Cluster elements from the old stream proceeds while information is obtained concerning the Matroska container file containing the new stream. When the playback device 200 detects a change in streaming conditions, determines that a higher bitrate stream can be utilized at the present streaming conditions, or receives a trick play instruction from a user, the playback device can use the top level index file to identify the URI for a more appropriate alternative stream to at

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least one of the video, audio, or subtitle streams from which the playback device is currently requesting encoded media. The playback device can save the information concerning the current stream(s) and can request the byte ranges of the headers for the Matroska container file(s) containing the new stream(s) using the parameters of the corresponding URIs. Caching the information in this way can be beneficial when the playback device attempts to adapt the bitrate of the stream downward. When the playback device experiences a reduction in available bandwidth, the playback device ideally will quickly switch to a lower bitrate stream. Due to the reduced bandwidth experienced by the playback device, the playback device is unlikely to have additional bandwidth to request header and index information. Ideally, the playback device utilizes all available bandwidth to download already requested higher rate Cluster elements and uses locally cached index information to start requesting Cluster elements from Matroska container file(s) containing lower bitrate stream(s). When a hierarchical index is used, the playback device typically will download additional index information. However, the amount of index information that is downloaded is significantly reduced as the headers of the Matroska container file are already cached on the playback device and the playback device only needs a portion of the index in order commence requesting Cluster elements from the Matroska container file(s) containing the new stream(s).

[00126] Byte ranges for index information for the Matroska container file(s) containing the new stream(s) can be requested from the HTTP server 202 in a manner similar to that outlined above with respect to FIG. 11. At which point, the playback device can stop downloading of cluster elements from the previous streams and can commence requesting the byte ranges of the appropriate Cluster elements from the Matroska container file(s) containing the new stream(s) from the HTTP server, using the index information from the Matroska container file(s) to identify the Cluster element(s) containing the encoded media following the encoded media in the last Cluster element retrieved by the playback device. As noted above, the encoding of the alternative streams so that corresponding Cluster elements within alternative streams (i.e. Cluster elements containing the same portion of the source media encoded in accordance with

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different encoding parameters) start with the same Timecode element and an IDR frame facilitates the smooth transition from one stream to another. In addition, the use of common cryptographic information further facilitates smooth switching between alternative streams.

[00127] When the Matroska file includes a hierarchical index, the process for switching between streams can involve downloading less than the entire index of the new streams. The index information can be downloaded by requesting the byte range for the hierarchical index and then using the Timecode attribute of media played back by the playback device 200 to identify the location of CuePoint elements within the Matroska container file(s) containing the new stream(s) that reference Cluster elements containing sequential encoded media and requesting the byte ranges of the CuePoint elements from the HTTP server 202. After the HTTP server has provided the byte ranges including the CuePoint elements, the playback device can use the information within the CuePoint elements to request byte ranges containing desired Cluster elements from the HTTP server. At which point, playback of the encoded media contained within the Cluster elements proceeds in the manner discussed above.

[00128] When the playback device caches the header and the entire index for each stream that has be utilized in the playback of the media, the process of switching back to a previously used stream can be simplified. The playback device already has the header and index information for the Matroska file containing the previously utilized stream and the playback device can simply use this information to start requesting Cluster elements from the Matroska container file of the previously utilized stream via HTTP. Communication between a playback device and an HTTP server when switching back to a stream(s) for which the playback device has cached header and index information in accordance with an embodiment of the invention is illustrated in FIG. 12b. The process illustrated in FIG. 12b is ideally performed when adapting bitrate downwards, because a reduction in available resources can be exacerbated by a need to download index information in addition to media. The likelihood of interruption to playback is reduced by increasing the speed with which the playback device can switch between streams and reducing the amount of overhead data downloaded to achieve the

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switch. When a hierarchical index is utilized, the playback device requests the appropriate portion of the index from the Matroska container file(s) containing the lower bitrate stream(s) prior to requesting Cluster elements from the Matroska container file.

[00129] Although the present invention has been described in certain specific aspects, many additional modifications and variations would be apparent to those skilled in the art. It is therefore to be understood that the present invention may be practiced otherwise than specifically described, including various changes in the implementation such as utilizing encoders and decoders that support features beyond those specified within a particular standard with which they comply, without departing from the scope and spirit of the present invention. Thus, embodiments of the present invention should be considered in all respects as illustrative and not restrictive.

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WHAT IS CLAIMED:

1. 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 based on the detected streaming conditions;

requesting portions of the selected stream;

locating encryption information that identifies encrypted portions of frames of video within the selected stream;

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 portions of video from the alternative stream.

2. The playback device of claim 1, wherein the step of requesting portions of the selected stream further comprises the step of obtaining a container file containing protected video from at least one of the plurality of alternative streams, where the container file also includes encryption information that identifies portions of frames of video that are encrypted and a reference to at least one key from the set of common keys to utilize in accessing the encrypted portions of the frames of video.

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3. The playback device of claim 1, wherein the located encryption information comprises a reference to the start of an encrypted block of data.

4. The playback device of claim 3, wherein the located encryption information further comprises the size of the encrypted block of data.

5. The playback device of claim 3, wherein the located encryption information further comprises cryptographic information that can be utilized to access the encrypted portion of the frame.

6. The playback device of claim 5, wherein the cryptographic information is a reference to at least one key from the set of common keys.

7. 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 based on the detected change;

decrypting each encrypted portion of the frames of video from the second alternative stream using the set of common keys; and

playing back the decrypted portions of video from the second alternative stream.

8. The playback device of claim 1, wherein the application is further for causing the set of processors to perform the step of receiving a top-level index and a container index that provide byte ranges for at least one encrypted encoding within an associated container file.

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9. The playback device of claim 1, wherein the application is further for causing the set of processors to perform the steps of:

transmitting a request for content to a set of one or more content distribution servers; and

receiving the content from the set of one or more content distribution servers.

10. The playback device of claim 9, wherein the application is further for causing the set of processors to perform the steps of:

transmitting a request for cryptographic information including the set of common keys to a set of one or more DRM servers; and

receiving the cryptographic information from the set of one or more DRM servers.

11. The playback device of claim 1, wherein the application is further for causing the set of processors to perform the step of obtaining a container index that provides byte ranges for portions of the selected stream, 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.

12. The playback device of claim 1, wherein the common set of keys comprises a plurality of keys.

13. A method for playing protected content from a plurality of alternative streams, 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 based on the detected streaming conditions;

requesting portions of the selected stream;

locating encryption information that identifies encrypted portions of frames of video within the selected stream;

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 portions of video from the alternative stream.

14. The method of claim 13, wherein requesting portions of the selected stream further comprises obtaining a container file containing protected video from at least one of the plurality of alternative streams, where the container file also includes encryption information that identifies portions of frames of video that are encrypted and a reference to at least one key from the set of common keys to utilize in accessing the encrypted portions of the frames of video.

15. The method of claim 13, wherein the located encryption information comprises a reference to the start of an encrypted block of data.

16. The method of claim 15, wherein the located encryption information further comprises the size of the encrypted block of data.

17. The method of claim 15, wherein the located encryption information further comprises cryptographic information that can be utilized to access the encrypted portion of the frame.

18. The method of claim 17, wherein the cryptographic information is a reference to at least one key from the set of common keys.

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19. The method of claim 13 further comprising:

detecting a change in the streaming conditions;

identifying a second alternative stream based on the detected change;

decrypting each encrypted portion of the frames of video from the second alternative stream using the set of common keys; and

playing back the decrypted portions of video from the second alternative stream.

20. The method of claim 13 further comprising receiving a top-level index and a container index that provide byte ranges for at least one encrypted encoding within an associated container file.

21. The method of claim 13 further comprising:

transmitting a request for content to a set of one or more content distribution servers; and

receiving the content from the set of one or more content distribution servers.

22. The method of claim 21 further comprising:

transmitting a request for cryptographic information including the set of common keys to a set of one or more DRM servers; and

receiving the cryptographic information from the set of one or more DRM servers.

23. The method of claim 13 further comprising obtaining a container index that provides byte ranges for portions of the selected stream, wherein requesting portions of the selected stream further comprises generating byte range requests for portions of the selected stream using the container index.

24. The method of claim 13, wherein the common set of keys comprises a plurality of keys.

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Abstract

Systems and methods for performing adaptive bitrate streaming using alternative streams of protected content in accordance with embodiments of the invention are described. One embodiment of the invention includes a processor, and memory containing a client application. In addition, the client application configures the processor to: request a top level index file identifying a plurality of alternative streams of protected content, where each of the alternative streams of protected content are encrypted using common cryptographic information; obtain the common cryptographic information; request portions of content from at least the plurality of alternative streams of protected content; access the protected content using the common cryptographic information; and playback the content.

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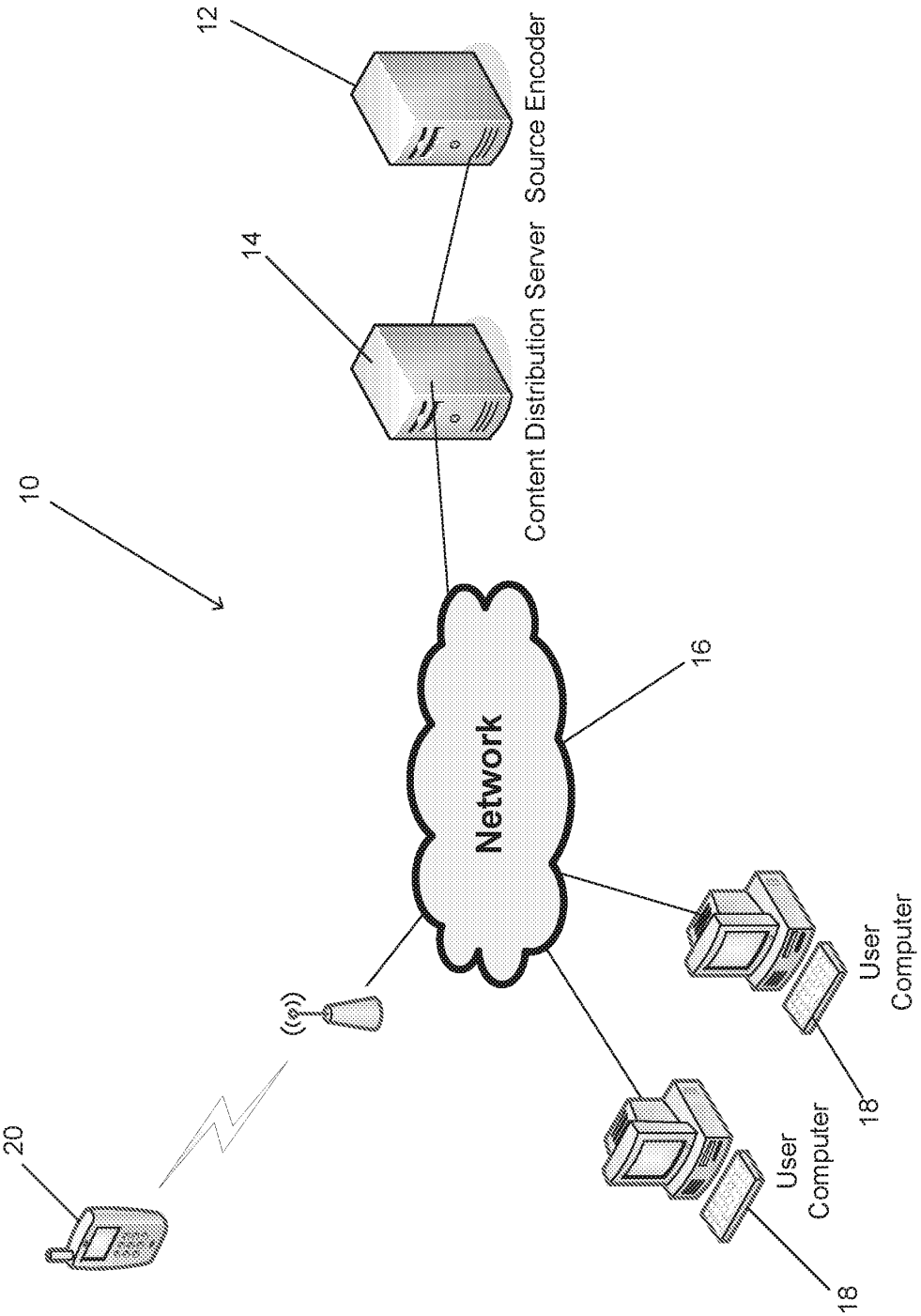

12
Content Distribution Server Source Encoder
14
10
Network
16
User Computer
18
User Computer
18
20

FIG. 1A

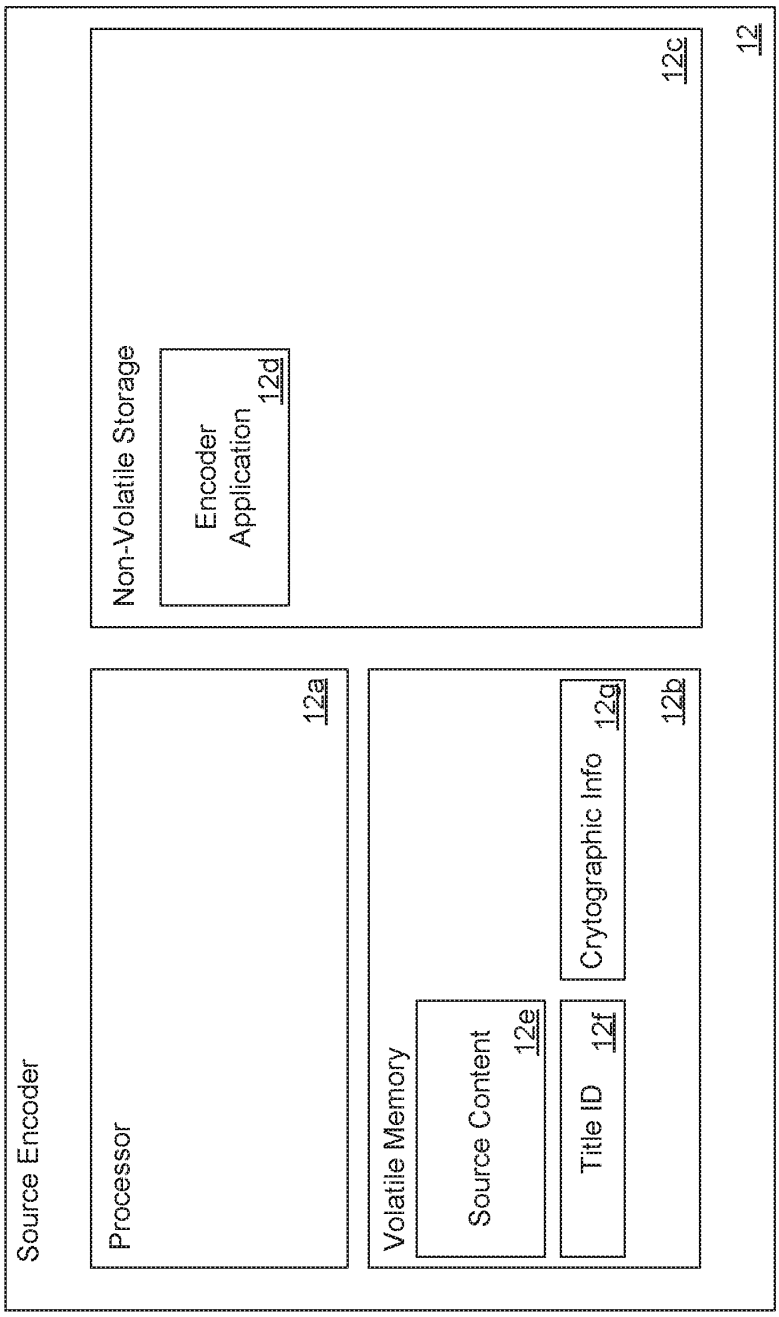

Source Encoder
Processor
12a
Volatile Memory
Source Content
12e
Title ID
12f
Crytographic Info
12g
12b
Non-Volatile Storage
Encoder Application
12d
12c
12

FIG. 1B

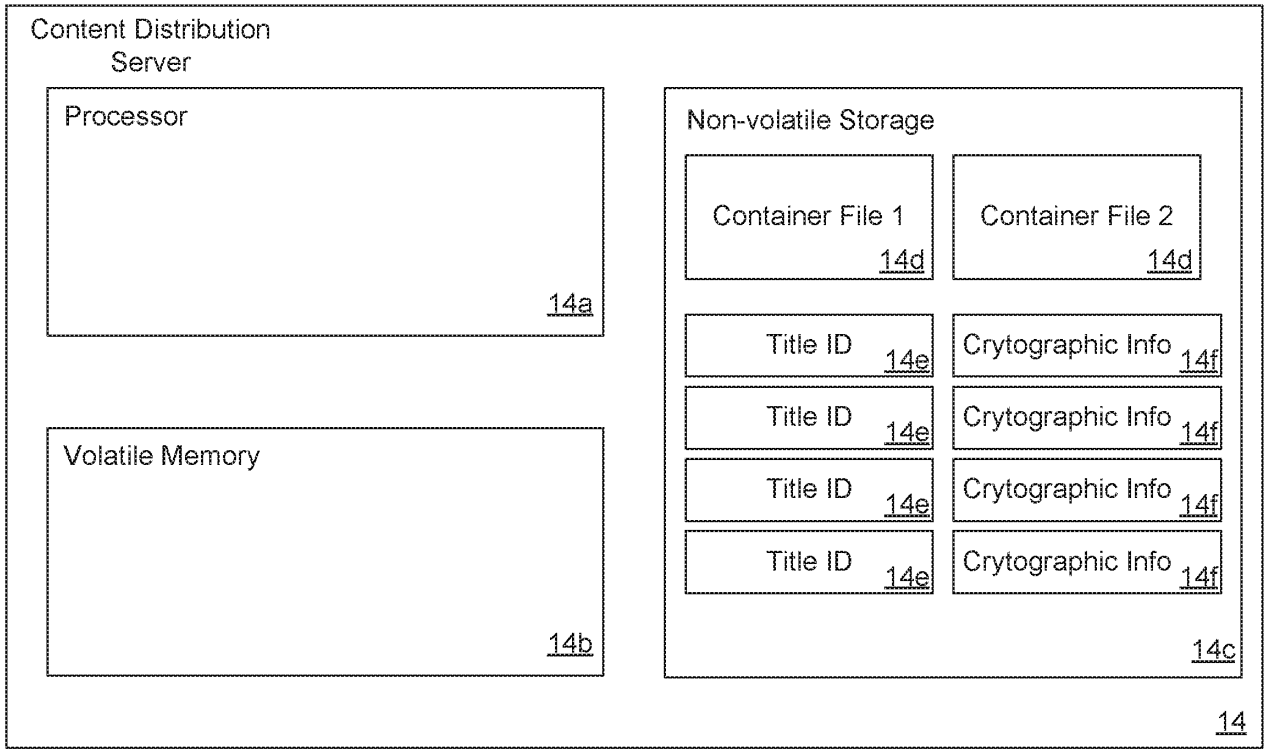

Content Distribution Server
Processor
14a
Volatile Memory
14b
Non-volatile Storage
Container File 1
14d
Container File 2
14d
Title ID
14e
Crytographic Info
14f
Title ID
14e
Crytographic Info
14f
Title ID
14e
Crytographic Info
14f
Title ID
14e
Crytographic Info
14f
14c
14

FIG. 1C

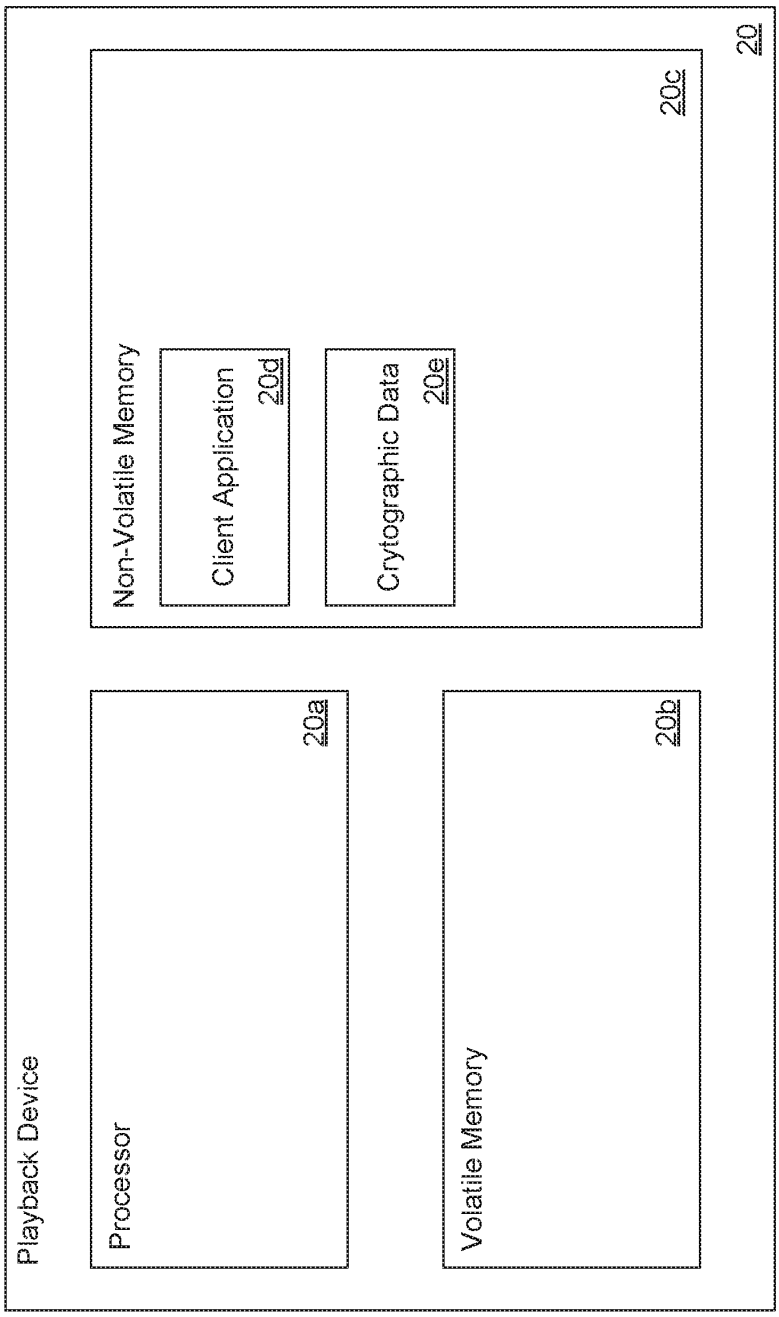

Playback Device
20
Processor
20a
Volatile Memory
20b
Non-Volatile Memory
20c
Client Application
20d
Crytographic Data
20e

FIG. 1D

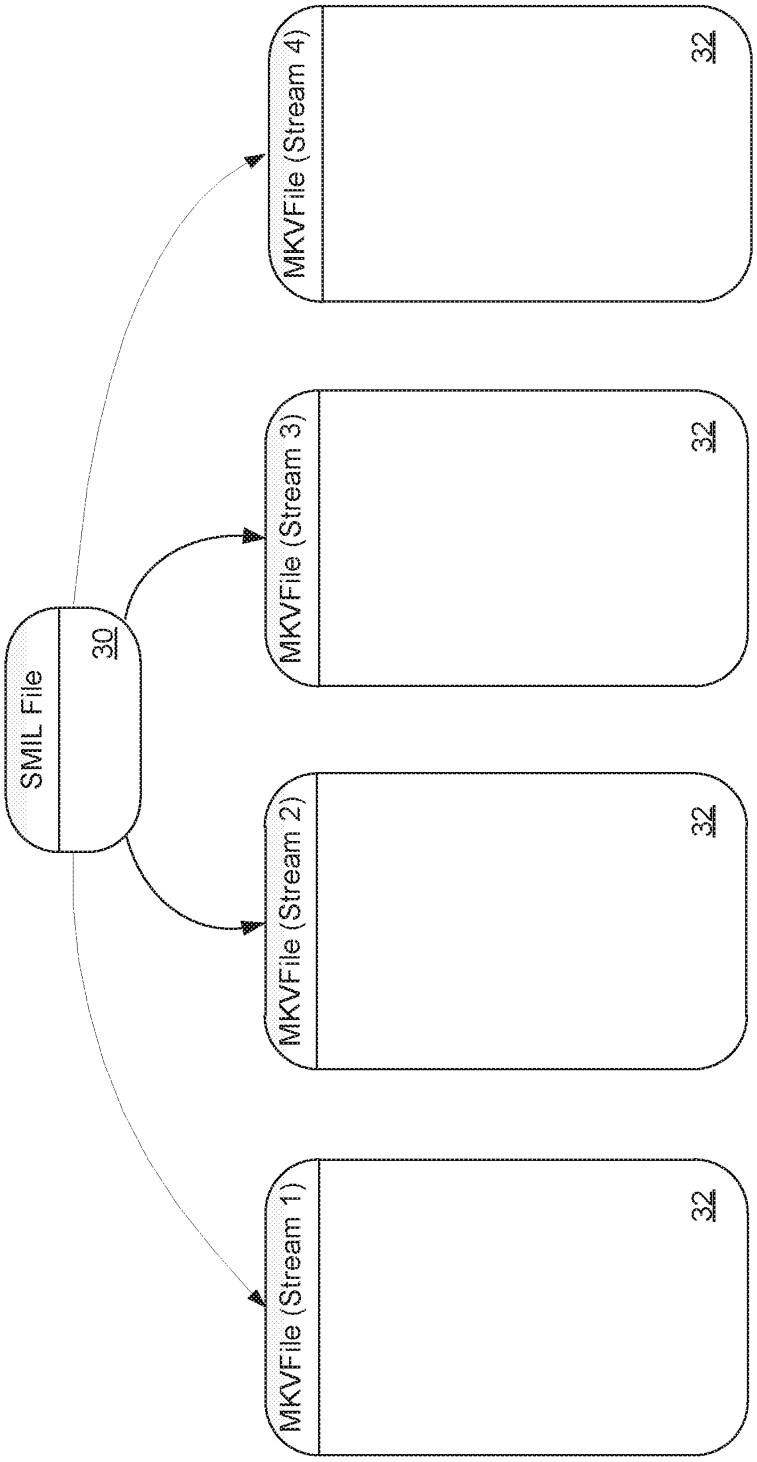

SMIL File
30
MKVFile (Stream 1)
32
MKVFile (Stream 2)
32
MKVFile (Stream 3)
32
MKVFile (Stream 4)
32

FIG. 2

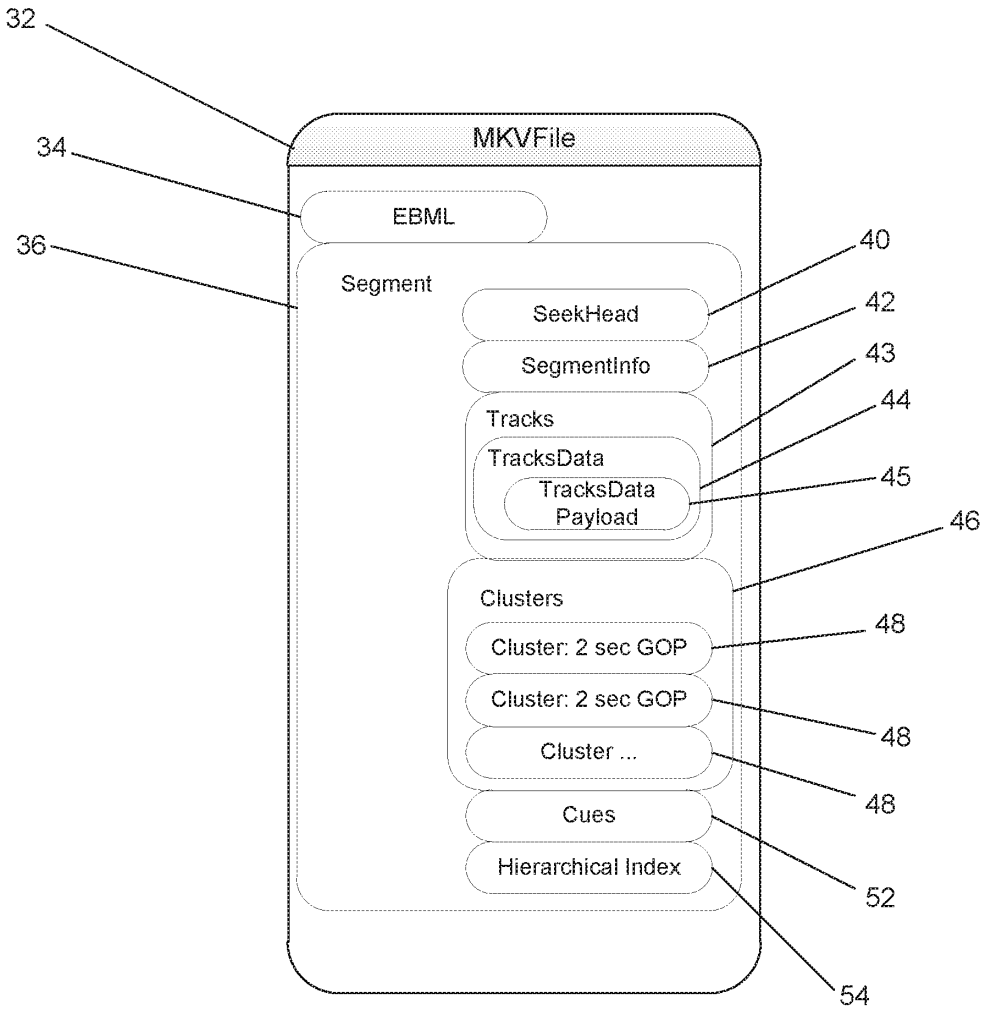

32
MKVFile
34
EBML
36
Segment
40
SeekHead
42
SegmentInfo
43
Tracks
44
TracksData
45
TracksData Payload
46
Clusters
48
Cluster: 2 sec GOP
Cluster: 2 sec GOP
48
Cluster ...
48
Cues
52
Hierarchical Index
54

FIG. 3

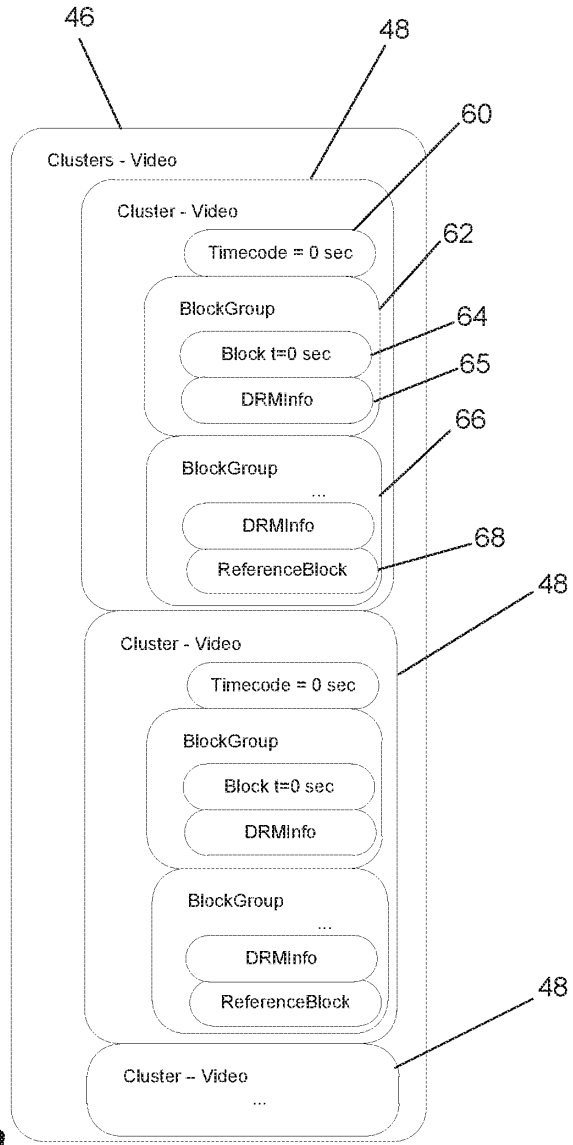

46
48
60
Clusters - Video
Cluster - Video
Timecode = 0 sec
62
BlockGroup
64
Block t=0 sec
65
DRMInfo
66
BlockGroup
...
DRMInfo
68
ReferenceBlock
48
Cluster - Video
Timecode = 0 sec
BlockGroup
Block t=0 sec
DRMInfo
BlockGroup
...
DRMInfo
ReferenceBlock
48
Cluster – Video
...

FIG. 4a

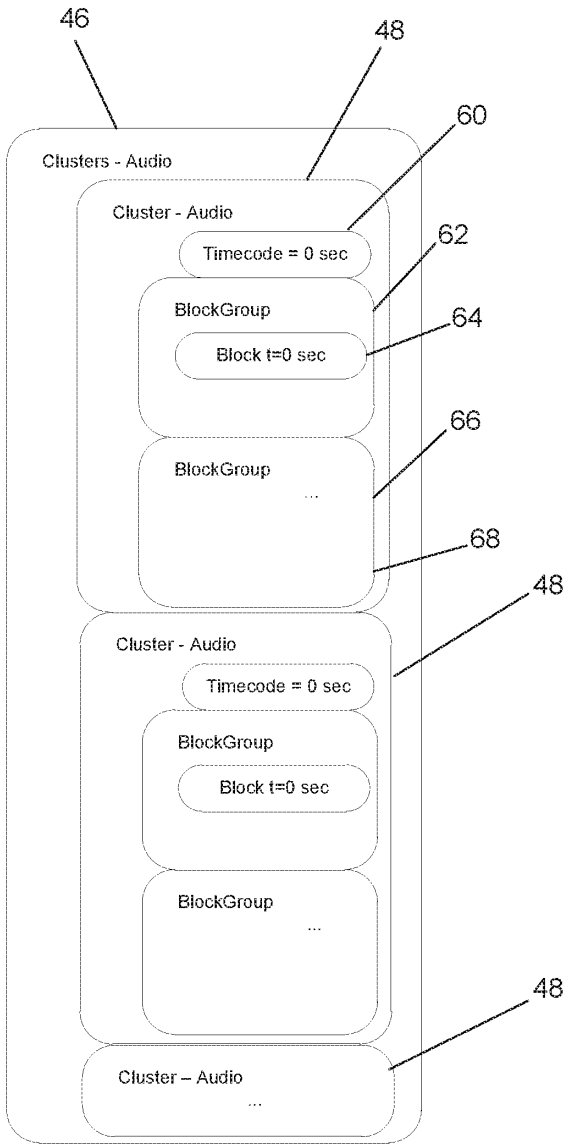

46
48
60
Clusters - Audio
Cluster - Audio
Timecode = 0 sec
62
BlockGroup
64
Block t=0 sec
66
BlockGroup
...
68
48
Cluster - Audio
Timecode = 0 sec
BlockGroup
Block t=0 sec
BlockGroup
...
48
Cluster – Audio
...

FIG. 4b

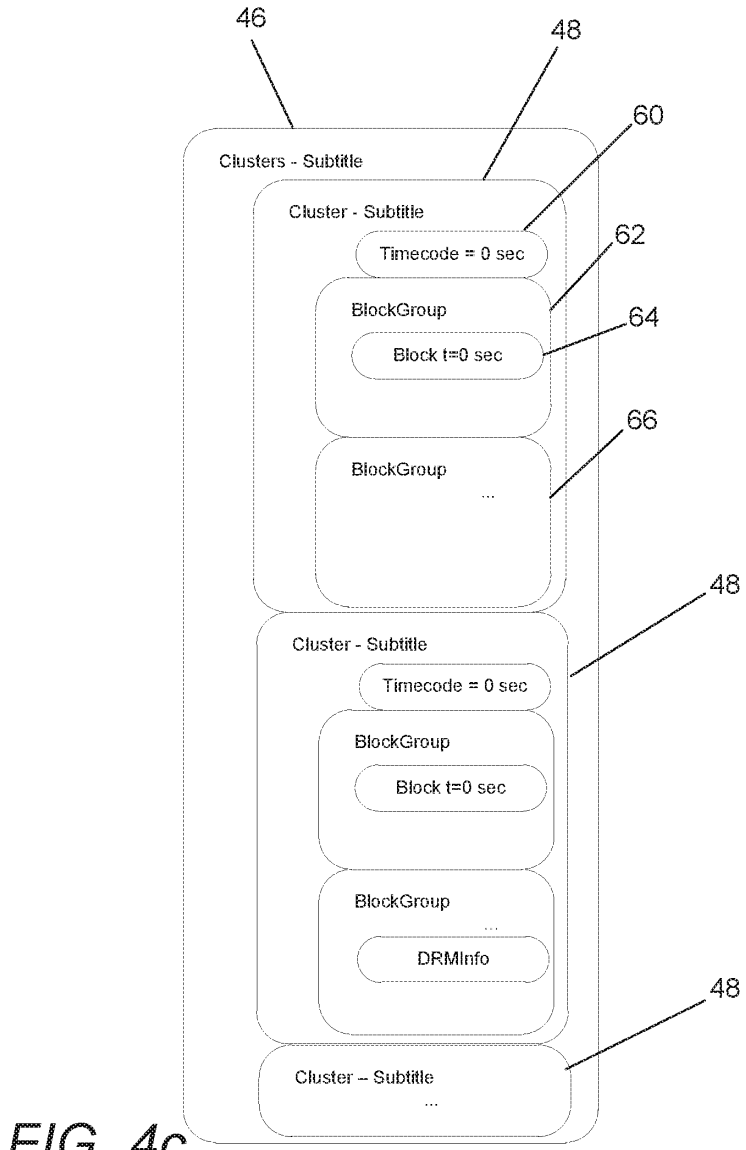

46
48
60
Clusters - Subtitle
Cluster - Subtitle
Timecode = 0 sec
62
BlockGroup
Block t=0 sec
64
66
BlockGroup
...
48
Cluster - Subtitle
Timecode = 0 sec
BlockGroup
Block t=0 sec
BlockGroup
...
DRMInfo
48
Cluster – Subtitle
...

FIG. 4c

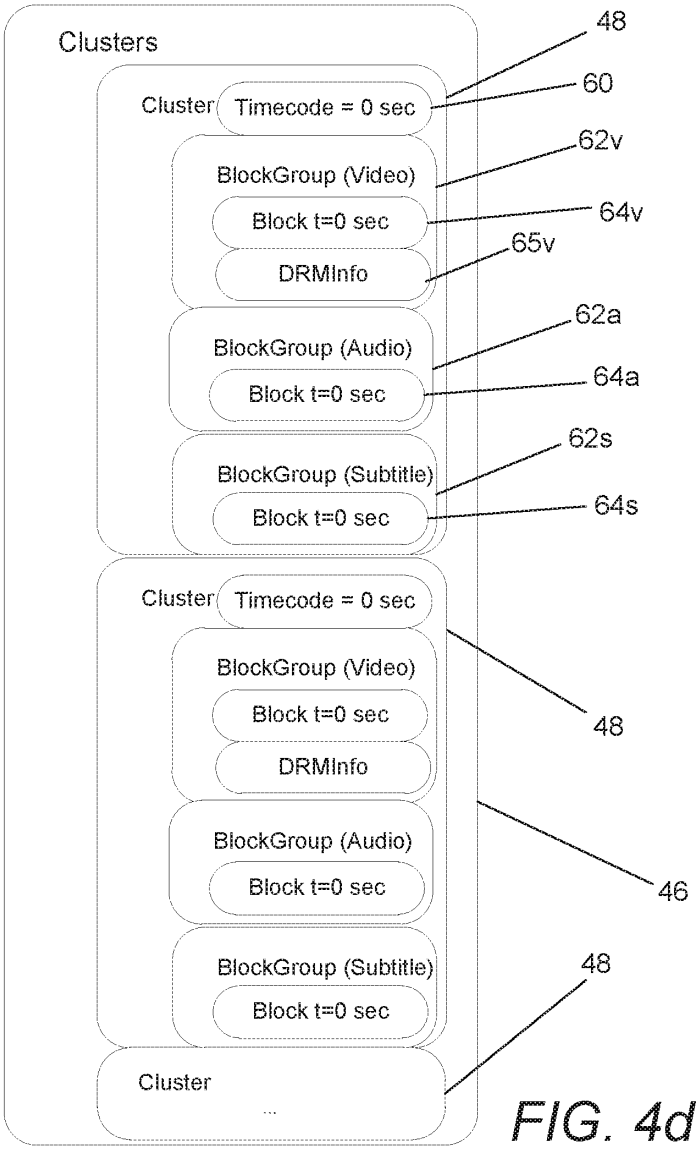

Clusters
48
Cluster
Timecode = 0 sec
60
62v
BlockGroup (Video)
Block t=0 sec
64v
DRMInfo
65v
62a
BlockGroup (Audio)
Block t=0 sec
64a
62s
BlockGroup (Subtitle)
Block t=0 sec
64s
Cluster
Timecode = 0 sec
BlockGroup (Video)
Block t=0 sec
DRMInfo
48
BlockGroup (Audio)
Block t=0 sec
46
BlockGroup (Subtitle)
Block t=0 sec
48
Cluster
...

FIG. 4d

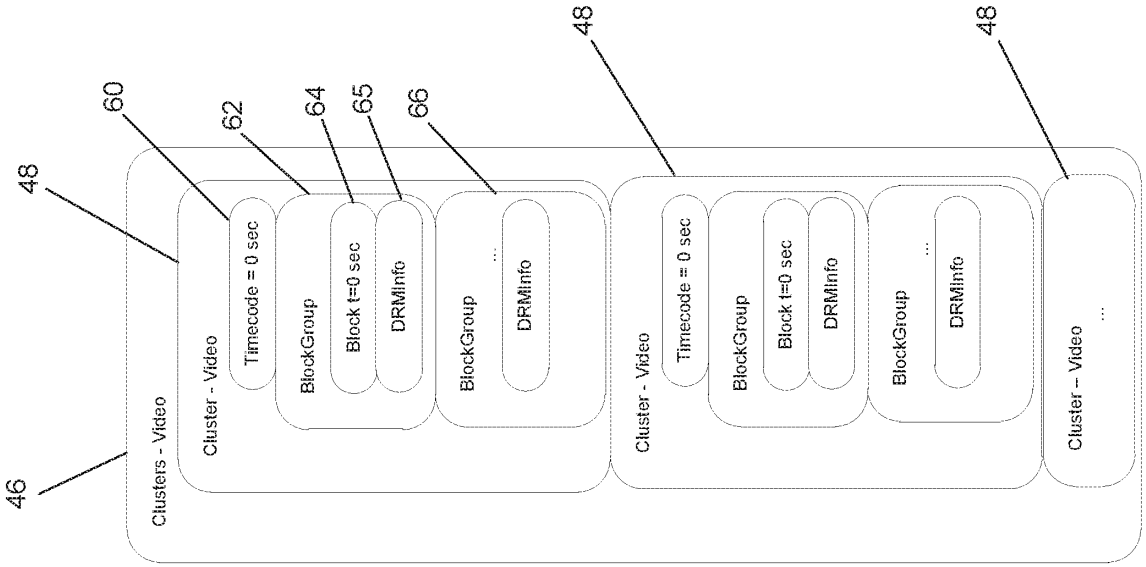


FIG. 4e

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0071
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

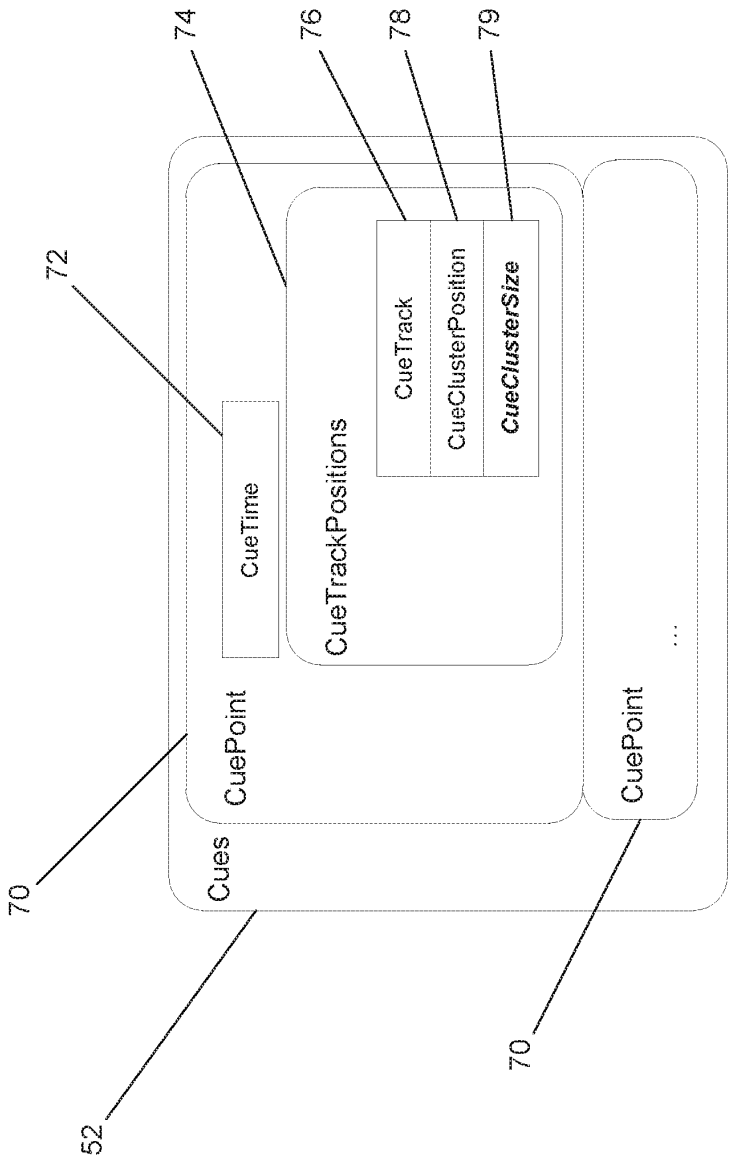

74
76
78
79
72
CueTrack
CueClusterPosition
CueClusterSize
CueTrackPositions
CueTime
CuePoint
Cues
...
CuePoint
70
52
70

FIG. 5

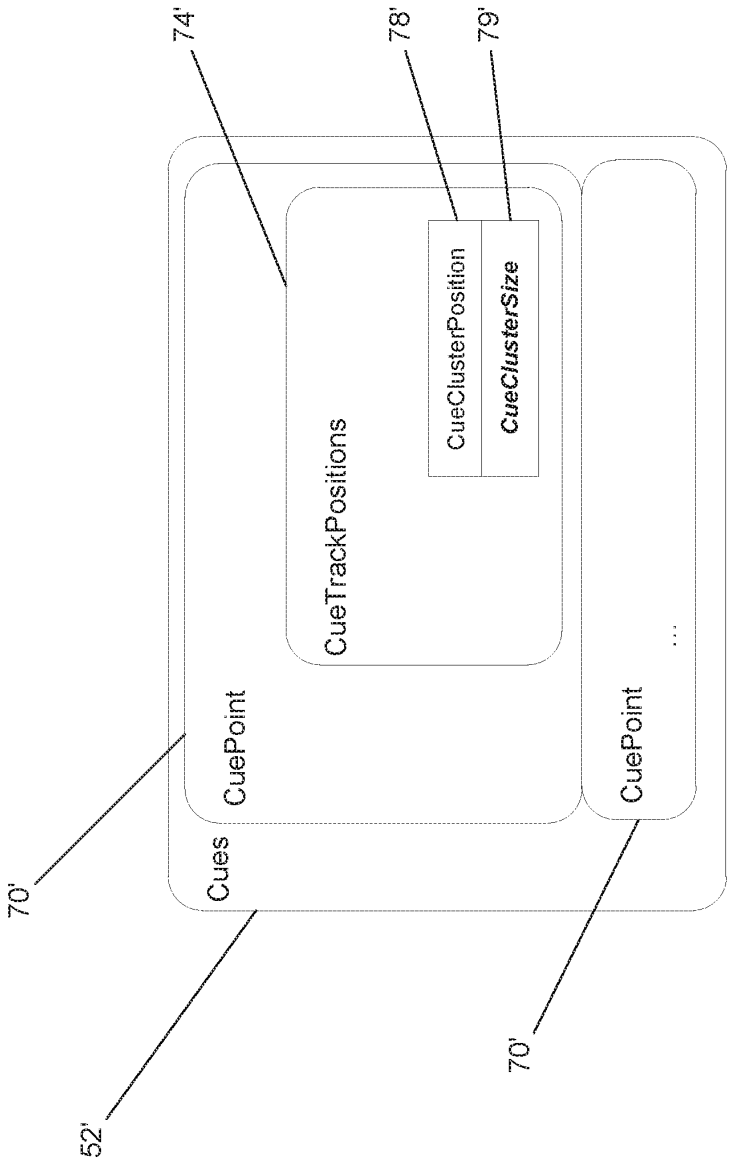

74'
78'
79'
CueClusterPosition
CueClusterSize
CueTrackPositions
CuePoint
...
CuePoint
Cues
70'
52'
70'

FIG. 5a

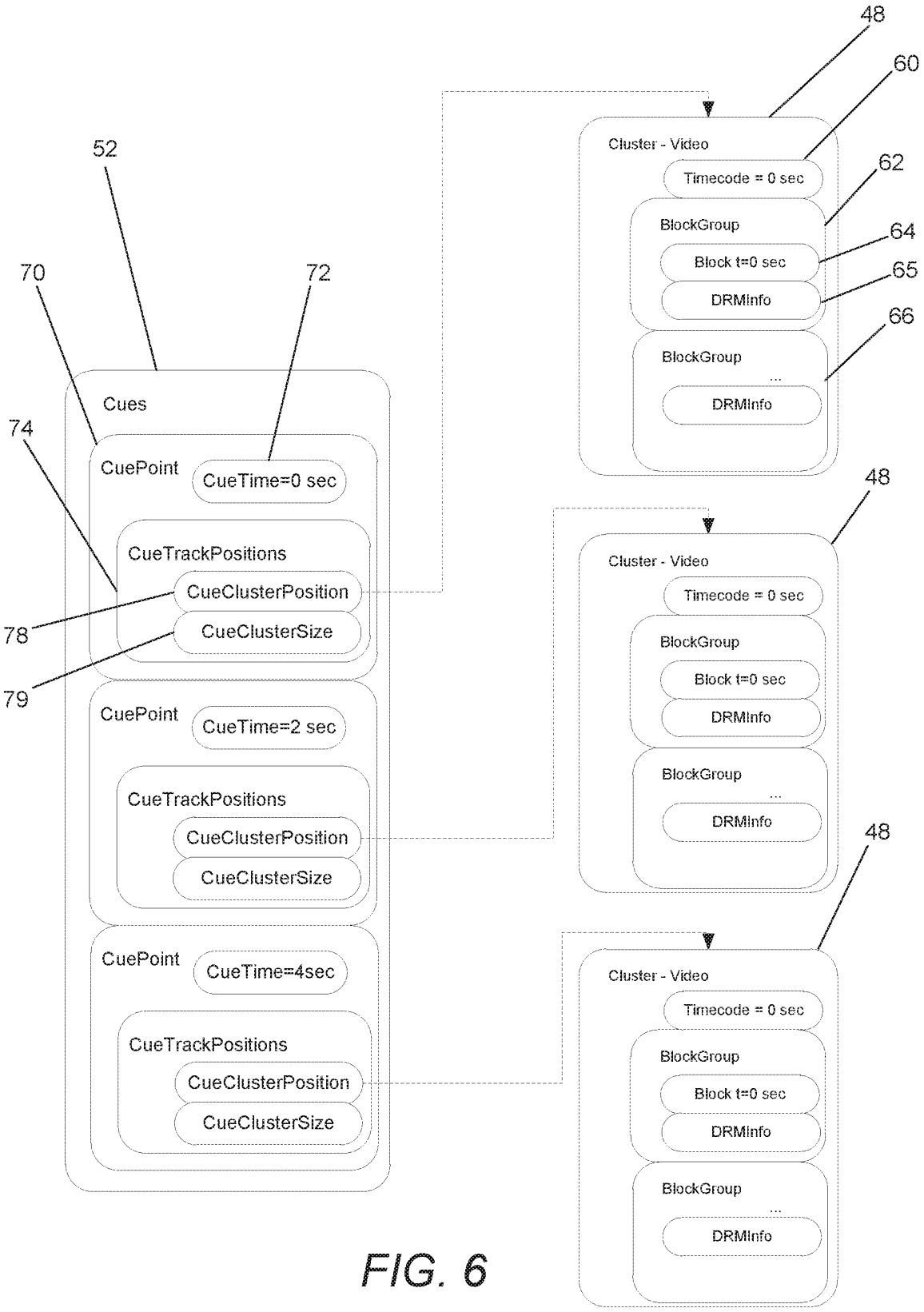

48
60
52
Cluster - Video
Timecode = 0 sec
62
BlockGroup
64
Block t=0 sec
65
DRMInfo
66
BlockGroup
...
DRMInfo
70
72
Cues
74
CuePoint
CueTime=0 sec
CueTrackPositions
CueClusterPosition
CueClusterSize
78
79
CuePoint
CueTime=2 sec
CueTrackPositions
CueClusterPosition
CueClusterSize
CuePoint
CueTime=4sec
CueTrackPositions
CueClusterPosition
CueClusterSize
48
Cluster - Video
Timecode = 0 sec
BlockGroup
Block t=0 sec
DRMInfo
BlockGroup
...
DRMInfo
48
Cluster - Video
Timecode = 0 sec
BlockGroup
Block t=0 sec
DRMInfo
BlockGroup
...
DRMInfo

FIG. 6

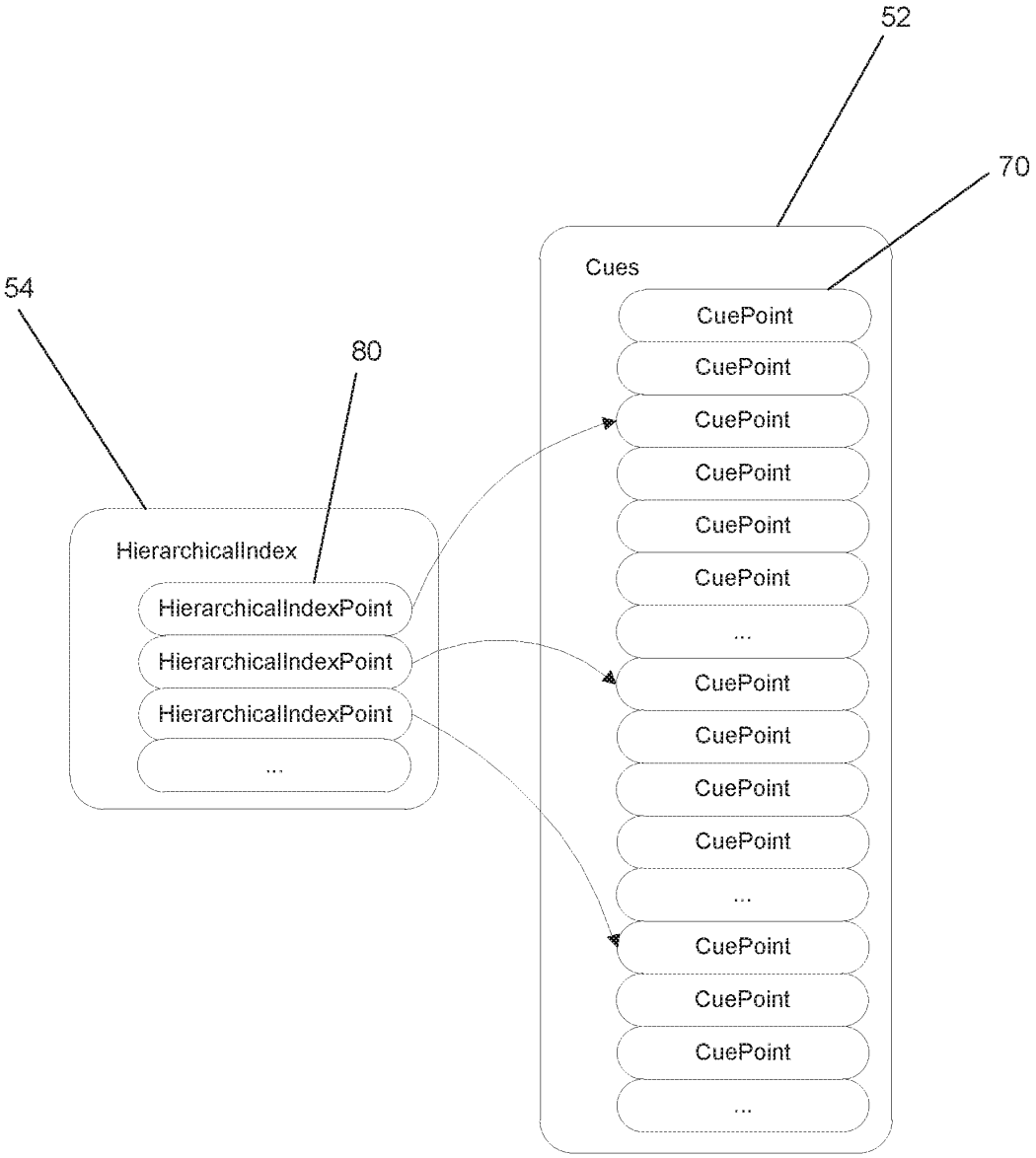

52
70
54
80
Cues
CuePoint
CuePoint
CuePoint
CuePoint
CuePoint
CuePoint
...
CuePoint
CuePoint
CuePoint
CuePoint
...
CuePoint
CuePoint
CuePoint
...
HierarchicalIndex
HierarchicalIndexPoint
HierarchicalIndexPoint
HierarchicalIndexPoint
...

FIG. 7

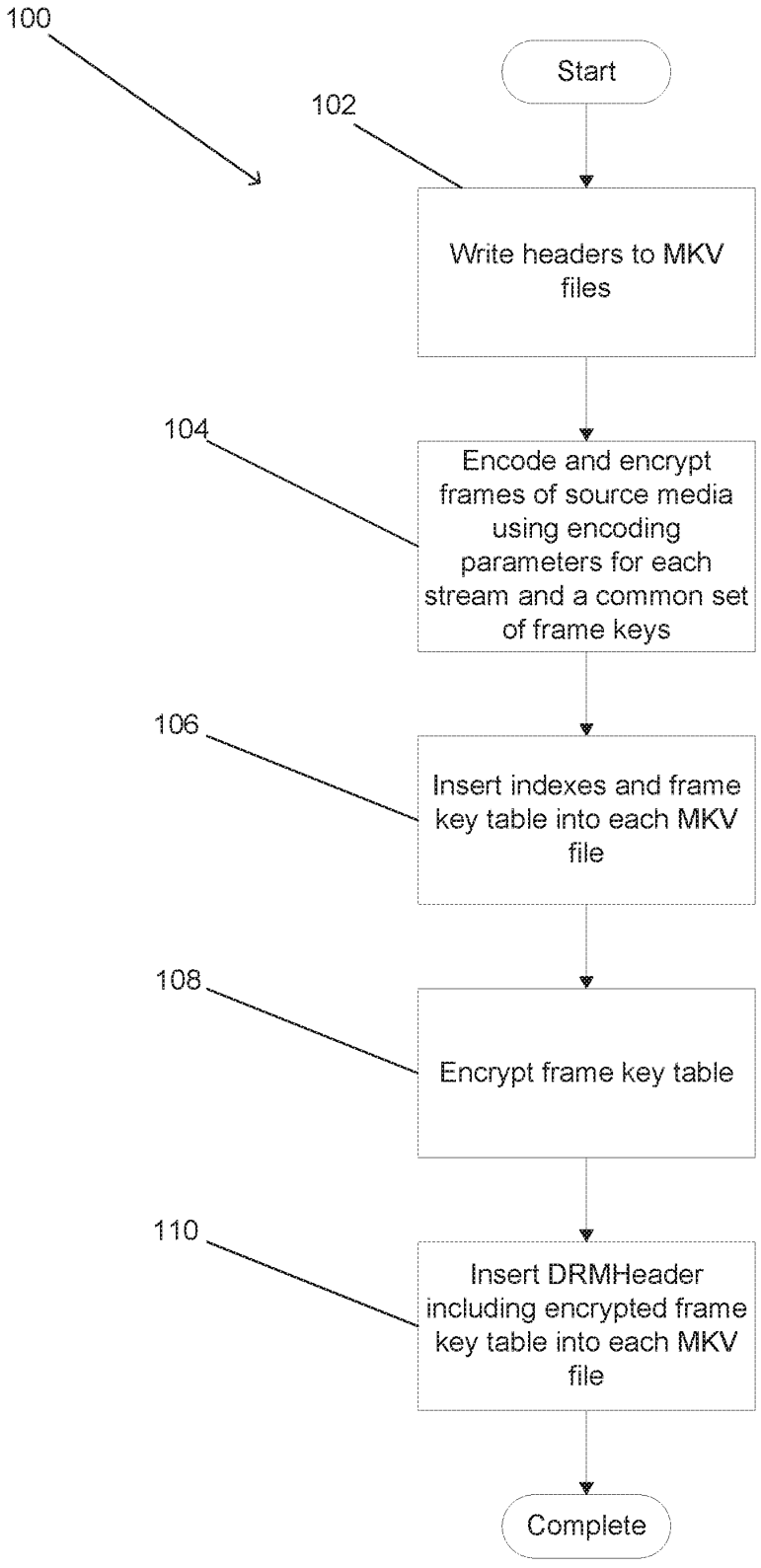

100
Start
102
Write headers to MKV files
104
Encode and encrypt frames of source media using encoding parameters for each stream and a common set of frame keys
106
Insert indexes and frame key table into each MKV file
108
Encrypt frame key table
110
Insert DRMHeader including encrypted frame key table into each MKV file
Complete

FIG. 8

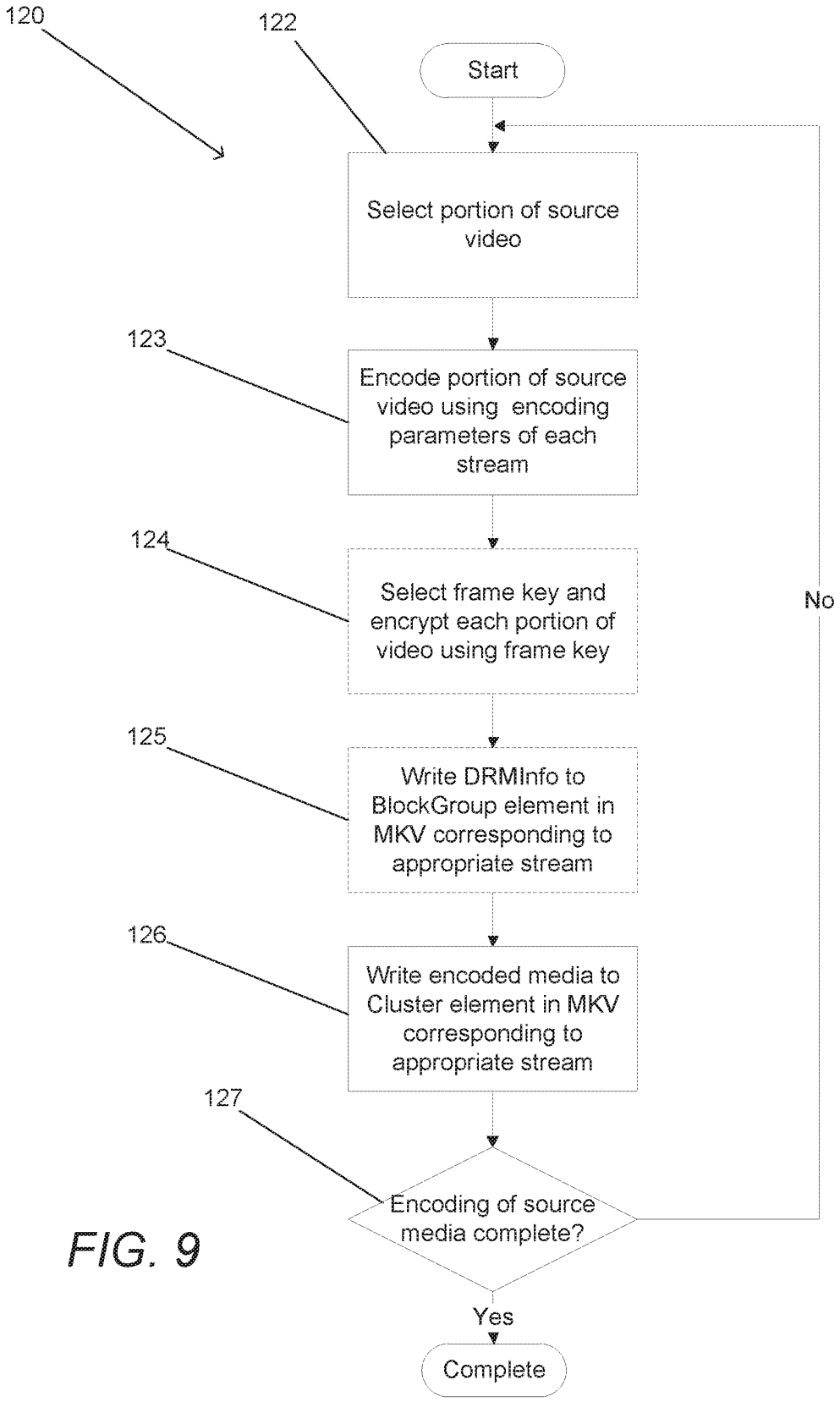

120
122
Start
Select portion of source video
123
Encode portion of source video using encoding parameters of each stream
124
Select frame key and encrypt each portion of video using frame key
125
Write DRMInfo to BlockGroup element in MKV corresponding to appropriate stream
126
Write encoded media to Cluster element in MKV corresponding to appropriate stream
127
Encoding of source media complete?
No
Yes
Complete

FIG. 9

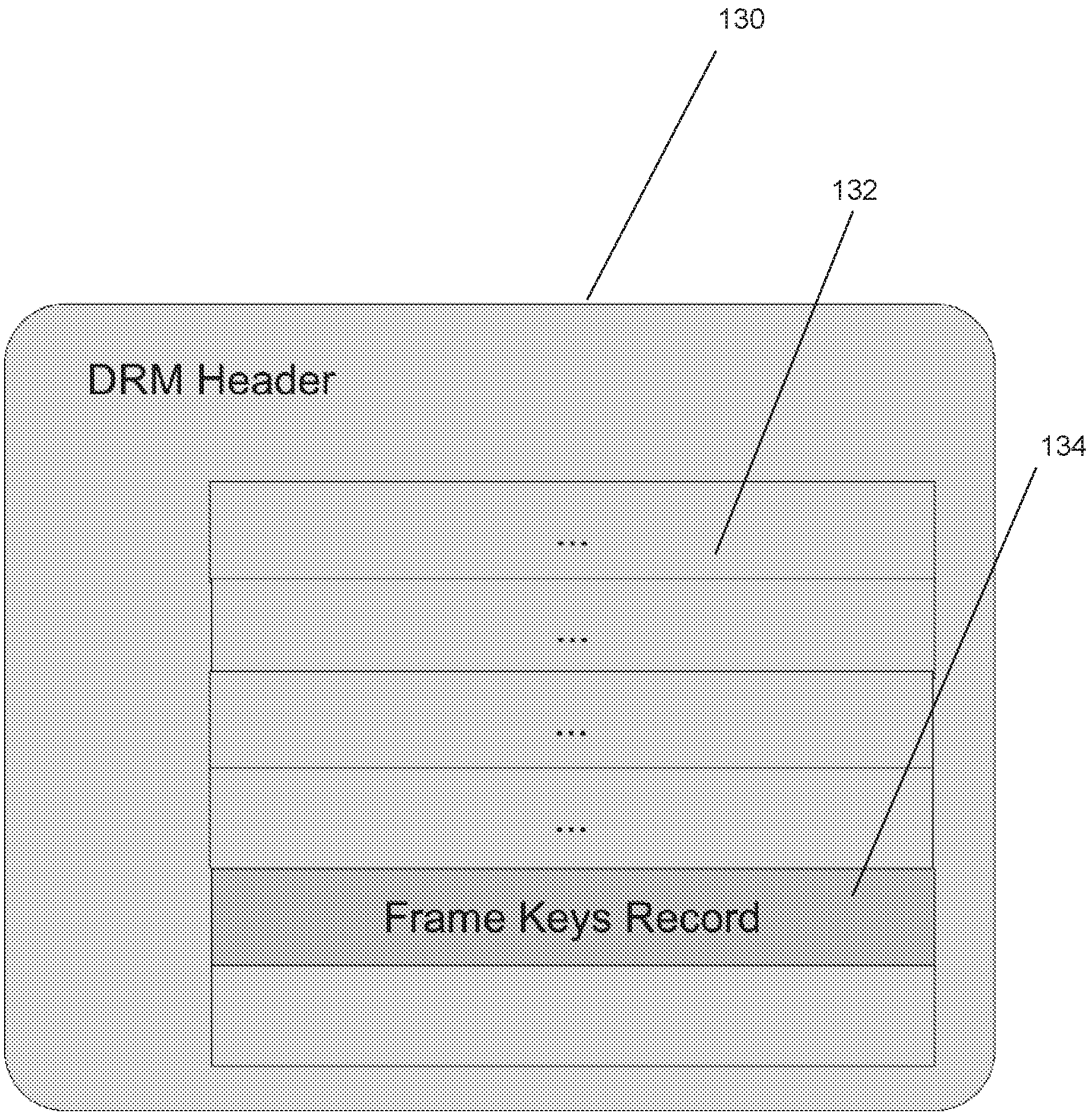


FIG. 10

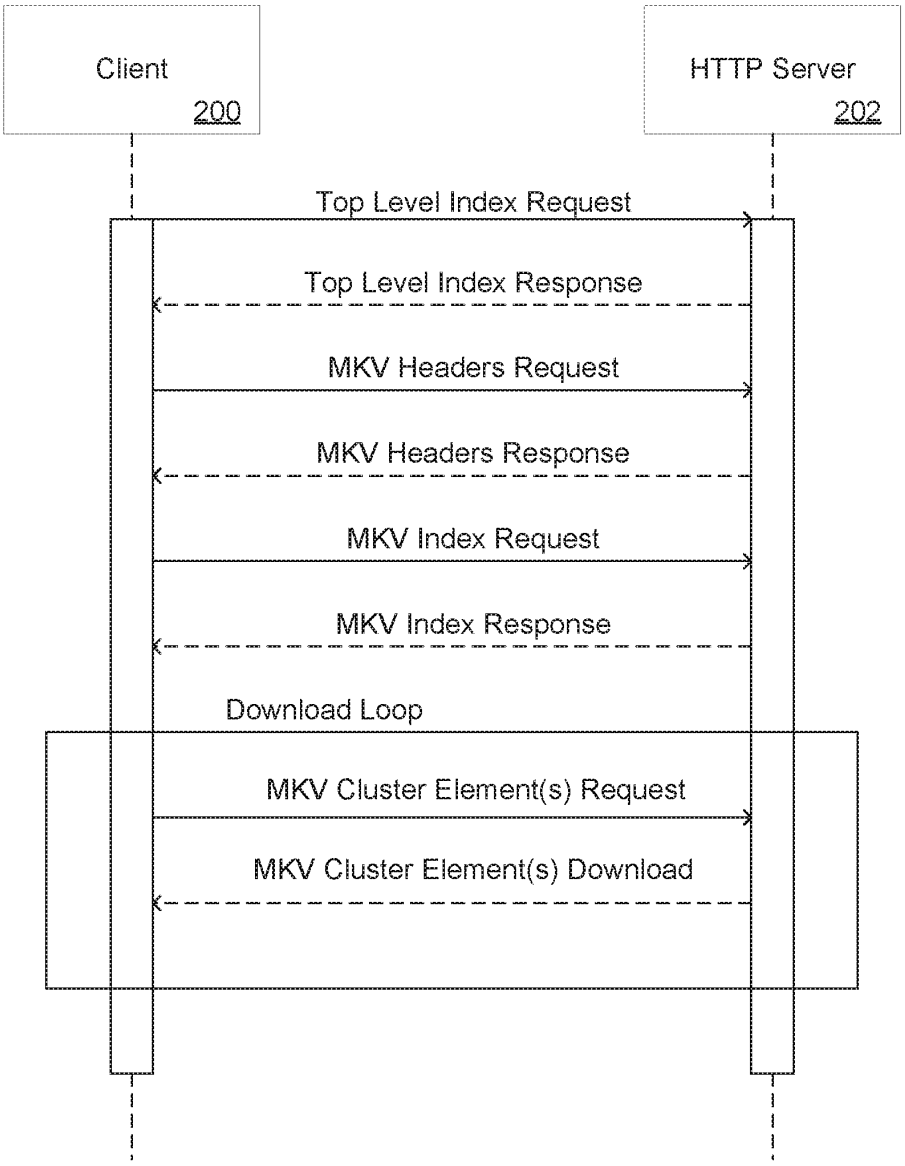

Client
200
HTTP Server
202
Top Level Index Request
Top Level Index Response
MKV Headers Request
MKV Headers Response
MKV Index Request
MKV Index Response
Download Loop
MKV Cluster Element(s) Request
MKV Cluster Element(s) Download

FIG. 11

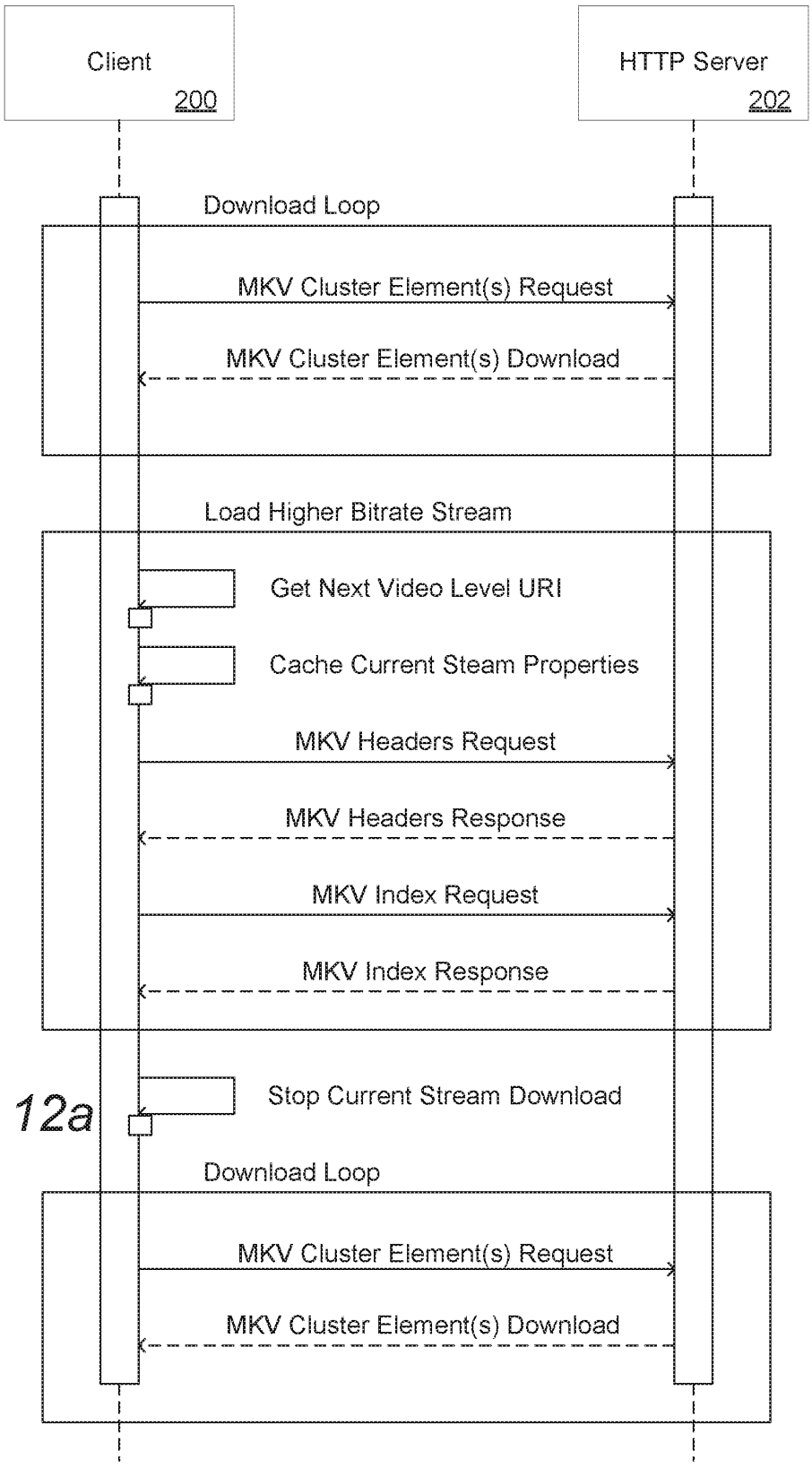

Client
200
HTTP Server
202
Download Loop
MKV Cluster Element(s) Request
MKV Cluster Element(s) Download
Load Higher Bitrate Stream
Get Next Video Level URI
Cache Current Steam Properties
MKV Headers Request
MKV Headers Response
MKV Index Request
MKV Index Response
Stop Current Stream Download
Download Loop
MKV Cluster Element(s) Request
MKV Cluster Element(s) Download

FIG. 12a

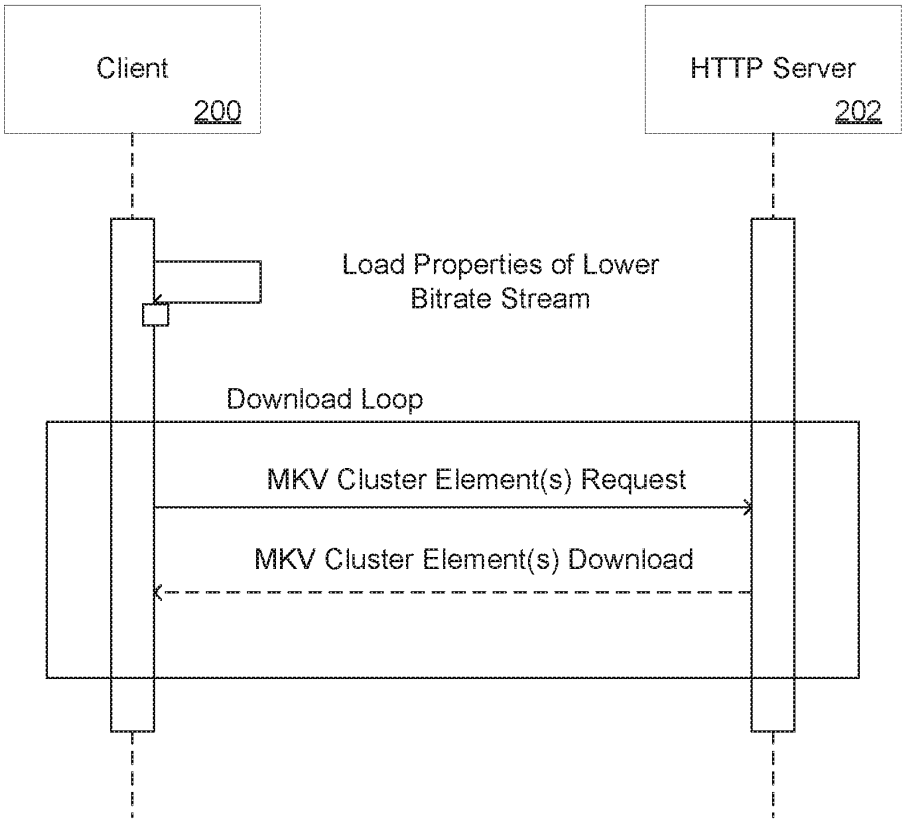

Client
200
HTTP Server
202
Load Properties of Lower Bitrate Stream
Download Loop
MKV Cluster Element(s) Request
MKV Cluster Element(s) Download

FIG. 12b

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
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:	David J. Bailey/Katrina Lee
Attorney Docket Number:	D1-02359A.CON5

Filed as Large Entity

Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	300	300
UTILITY SEARCH FEE	1111	1	660	660
UTILITY EXAMINATION FEE	1311	1	760	760
REQUEST FOR PRIORITIZED EXAMINATION	1817	1	4000	4000
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	1202	4	100	400
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
PROCESSING FEE, EXCEPT PROV. APPLS.	1830	1	140	140
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**6260**

Electronic Acknowledgement Receipt	
EFS ID:	33772617
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:	David J. Bailey/Katrina Lee
Filer Authorized By:	David J. Bailey
Attorney Docket Number:	D1-02359A.CON5
Receipt Date:	19-SEP-2018
Filing Date:	
Time Stamp:	21:25:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$6260
RAM confirmation Number	092018INTEFSW21260900
Deposit Account	504407
Authorized User	Katrina Lee
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	TrackOne Request	02359acon5reqtrack1.pdf	125169 3e61ba1046a9bc05df93a70ac4b4c2cfa6ebdef4	no	1
Warnings:					
Information:					
2	Application Data Sheet	02359acon5ads.pdf	112465 c2a240811e7730732faf20a5b34020e6dd2b9b1c	no	8
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
3		02359acon5decxtml.pdf	1521144 f29ff321adcb6dfb612931f641795ed1f2a7ee1f	yes	8

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	5
	Oath or Declaration filed	6	8

Warnings:					
Information:					
4		02359acon5specification.pdf	229839 fd05e5f173182f46063dd62f470acc0b38cc1ddc	yes	49

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	43
	Claims	44	48

	Abstract		49	49	
Warnings:					
Information:					
5	Drawings-only black and white line drawings	02359acon5drawings.pdf	235527 f04ee0a7642e1fb677f670917d7007fbc1537f36	no	19
Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	42203 e200743a94f1f60f57341f0938131309af7fcd05	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2266347		

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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 September 19, 2018 at or before 11:59 p.m. Pacific Time under the Rules of 37 C.F.R. 1.8.

/Katrina Lee/
Katrina Lee

Appl No.	: Filed Herewith	Confirmation No. Unassigned
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.	: Unassigned	
Examiner	: Unassigned	
Docket No.	: D1-02359A.CON5	
Customer No.	: 71897	

INVENTOR'S OATH OR DECLARATION

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

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

Commissioner:

Applicant respectfully notes that declarations for inventors Michael George Kiefer, Eric William Grab, and Jason Braness were filed December 15, 2015 with EFS ID 24372759. A copy of the previously filed declarations is attached. Furthermore, Applicant respectfully notes that the instant application claims priority in accordance with 35 U.S.C. § 120 to applications including U.S. Patent Application No. 14/564,003, filed December 8, 2014. Declarations in accordance with 35 U.S.C. § 115(a) were filed on December 15, 2015 in U.S. Patent Application No. 14/564,003. In accordance with 35 U.S.C. § 115(g)(1)(A), Applicant respectfully submits that Applicant need not file Inventor's Oath or Declarations in the instant application in accordance with 35 U.S.C. § 115(a) as declarations meeting the requirements of U.S.C. § 115(a) were executed by the inventors and filed in connection with the earlier-filed application.

Inventor's Oath or Declaration

The Commissioner is authorized to charge any fee under 37 CFR 1.16 and 1.17 that 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 /David J. Bailey/
David J. Bailey
Registration No. 59,632
949.852.0000

DJB/kl

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0088
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

Electronic Acknowledgement Receipt	
EFS ID:	24372759
Application Number:	14564003
International Application Number:	
Confirmation Number:	5114
Title of Invention:	Systems and Methods for Playing Back Alternative Streams of Protected Content Protected Using Common Cryptographic Information
First Named Inventor/Applicant Name:	Michael George Kiefer
Customer Number:	71897
Filer:	Jason Daniel Wolfe/Katrina Lee
Filer Authorized By:	Jason Daniel Wolfe
Attorney Docket Number:	D1-02359A.CON
Receipt Date:	15-DEC-2015
Filing Date:	08-DEC-2014
Time Stamp:	20:19:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$960
RAM confirmation Number	7427
Deposit Account	504407
Authorized User	BAILEY, DAVID
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 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	Transmittal Letter	02359acondecxtml.pdf	100404	no	1
Warnings:					
Information:					
2	Oath or Declaration filed	02359acondeclaration.pdf	1020176	no	3
Warnings:					
Information:					
3	Issue Fee Payment (PTO-85B)	02359aconissuefeextml.pdf	1872415	no	3
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30903	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3023898		

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 MAILING

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on December 15, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 C.F.R. 1.8.

/Katrina Lee/
Katrina Lee

Appl No.	: 14/564,003	Confirmation No. 5114
Applicant	: Sonic IP, Inc.	
Filed	: December 8, 2014	
Title	: Systems and Methods for Playing Back Alternative Streams of Protected Content Protected Using Common Cryptographic Information	
TC/A.U.	: 2434	
Examiner	: Abiy Getachew	
Docket No.	: D1-02359A.CON	
Customer No.	: 71897	

TRANSMITTAL OF INVENTOR DECLARATIONS

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

2400 E. Katella, Suite 1050
Anaheim, CA 92806
December 15, 2015

Commissioner:

Enclosed are the signed Declarations of the inventors listed in this case.

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 /Jason D. Wolfe/
Jason D. Wolfe
Registration No. 71,327
949.852.0000

JDW/kl

DocCode – SCORE

SCORE Placeholder Sheet for IFW Content

Application Number: 16136183 Document Date: 09/19/2018

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/136,183	09/19/2018		2120	D1-02359A.CON5	24	2

CONFIRMATION NO. 2864

FILING RECEIPT

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

Date Mailed: 10/11/2018

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Michael George Kiefer, Lake Havasu City, AZ;
Eric William Grab, San Diego, CA;
Jason Braness, San Diego, CA;

Applicant(s)

DIVX, LLC, San Diego, CA;

Assignment For Published Patent Application

DIVX, LLC, San Diego, CA

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 15/481,340 04/06/2017
which is a CON of 14/970,412 12/15/2015 PAT 9621522
which is a CON of 14/564,003 12/08/2014 PAT 9247311
which is a CON of 13/340,623 12/29/2011 PAT 8909922
which claims benefit of 61/530,305 09/01/2011

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 10/10/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/136,183**

Projected Publication Date: 01/17/2019

Non-Publication Request: No

Early Publication Request: No

Title

Playback Devices and Methods for Playing Back Alternative Streams of Content Protected Using a Common Set of Cryptographic Keys

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0094
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

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IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/136,183

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	300
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	660
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	760
TOTAL CLAIMS (37 CFR 1.16(i))	24 minus 20 =	* 4			OR	x 100 =	400
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 460 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	2120

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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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 11/02/2018

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

EXAMINER
PATEL, ASHOKKUMAR B

ART UNIT	PAPER NUMBER
2491	

NOTIFICATION DATE	DELIVERY MODE
11/02/2018	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

UNITED STATES PATENT AND TRADEMARK OFFICE

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Doc Code:
TRACK1.GRANT

Decision Granting Request for Prioritized Examination (Track I or After RCE)	Application No.: 16/136,183

1. THE REQUEST FILED September 19, 2018 IS **GRANTED.**

The above-identified application has met the requirements for prioritized examination

A. ☒ for an original nonprovisional application (Track I).
B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination.** The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:

A. filing a **petition for extension of time** to extend the time period for filing a reply;
B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims**, or a multiple dependent claim;
C. filing a **request for continued examination**;
D. filing a notice of appeal;
E. filing a request for suspension of action;
F. mailing of a notice of allowance;
G. mailing of a final Office action;
H. completion of examination as defined in 37 CFR 41.102; or
I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to Diane Goodwyn at (571) 272-6735, Office of Petitions. In his/her absence, calls may be directed to Brian W. Brown, (571) 272-5338.

/Brian W. Brown/
[*Signature*]

Petitions Examiner
(Title)

U.S. Patent and Trademark Office
PTO-2298 (Rev. 02-2012)

Office of Petitions: Routing Sheet



Application No. 16136183

This application is being forwarded to your office for further processing. A decision has been rendered on a petition filed in this application, as indicated below. For details of this decision, please see the document PET.OP.DEC filed on the same date as this document.

- [X] **GRANTED**
- [ ] **DISMISSED**
- [ ] **DENIED**

Office of Petitions: Decision Count Sheet

Mailing Month 10

Application No. 16136183

16136183

For US serial numbers: enter number only, no slashes or commas. Ex: 10123456

For PCT: enter "51+single digit of year of filing+last 5 numbers", Ex. for PCT/US05/12345, enter 51512345

Deciding Official: Goodwyn, Diane

Count (1) - Palm Credit 16136183

Decision: GRANT

FINANCE WORK NEEDED

☐ Select Check Box for YES

GRANT

Decision Type: 643 - Track One request

643

Notes:

Count (2)

Decision: n/a

FINANCE WORK NEEDED

☐ Select Check Box for YES

Decision Type: NONE

Notes:

Count (3)

Decision: n/a

FINANCE WORK NEEDED

☐ Select Check Box for YES

Decision Type: NONE

Notes:

Initials of Approving Official (if required)

If more than 3 decisions, attach 2nd count sheet & mark this box ☐

Printed on: 10/27/2018

Office of Petitions Internal Document - Ver. 5.0

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]
		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.	

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	Attorney Docket Number	D1-02359A.CON5

		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.	
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		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.	
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		International Search Report and Written Opinion for International Application PCT/US14/30747, completed July 30, 2014, Mailed Aug 22, 2014, 7 pgs.	
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		International Search Report and Written Opinion for International Application PCT/US2011/066927, completed April 3, 2012, Mailed April 20, 2012, 14 pgs.	

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		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.	
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		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.	
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		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.	

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	Attorney Docket Number	D1-02359A.CON5

		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.	
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		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.	

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		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.	

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		"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		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:	34354164
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:	22:03:31
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	Other Reference-Patent/App/Search documents	PCTUS2011066927iprp.pdf	1805657 3afb447eff8ee3546dcb08e544c893e7807dea33	no	13
Warnings:					

Information:					
2	Other Reference-Patent/App/Search documents	pctus2011067243iprp.pdf	1035437 df0b80eed6f6a1ef1753b820752fe5f4fa10fd1d	no	7
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	PCTUS2014030747iprp.pdf	8327507 acfed93ca291d05ab67e3ba5843e8e273302afff	no	6
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Information:					
4	Other Reference-Patent/App/Search documents	pctus2007063950iprp.pdf	205212 6a272322fcc736af425508be230611a01b3ac076	no	3
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5	Other Reference-Patent/App/Search documents	pctus2008083816IPRP.pdf	462767 0f7fd1df79f21fbf72d6e68c3f9990df31b524fc	no	6
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Information:					
6	Other Reference-Patent/App/Search documents	PCTUS201056733iprp.pdf	296922 b146e3cc5c8f6c14c4dc93eef3df1dfac7e3db03	no	5
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8	Other Reference-Patent/App/Search documents	PCT2011067167ipr.pdf	563783 862b2b9da12cd2ad11da3b2df1d7420b023afbc3	no	8
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9	Other Reference-Patent/App/Search documents	PCTUS2013043181ipr.pdf	781904 61f38882e900e174bec1d9d3af4660f49fccbcd0	no	11
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Information:					
17	Other Reference-Patent/App/Search documents	PCT2010020372isrwo.pdf	687008 e79df5679174f020061c0c635bb72d62801df32b	no	8
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Information:					
18	Other Reference-Patent/App/Search documents	PCT201056733isrwo.pdf	791755 8d320f035477e276717cddf2930e1c2c0bf8b1db	no	9
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Information:					
19	Other Reference-Patent/App/Search documents	PCT2011067243isrwo.pdf	558146 511f1aac66c6c371603dbdd979ac0f2574e6b826	no	9
Warnings:					
Information:					
20	Other Reference-Patent/App/Search documents	PCT2013043181isrwo.pdf	1157900 6096281e16adc088a8317529cedcd41d6173b9df	no	12
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21	Other Reference-Patent/App/Search documents	PCTUS1430747isrwo.pdf	441868 8aaf760c18aed1bcb7ffa491bd1387cba5252f3c	no	7
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Information:					

23	Other Reference-Patent/App/Search documents	pctus2011066927israndwo.pdf	20543615 f972d4cff8460daf2a3b7777ff261385b65efa8d	no	14
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24	Other Reference-Patent/App/Search documents	pctus2011067167israndwo.pdf	1160661 a2ef2df3ffb25156275bc9d9840ae4f4e7adccee	no	11
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25	Other Reference-Patent/App/Search documents	pctus2011068276israndwo.pdf	12131256 f684d04685be239a15445d49b5a2c7593eb6e3c1	no	24
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26	Other Reference-Patent/App/Search documents	pctus2013020572israndwo.pdf	1074521 6c8e54923f95b283ac2073a6903250ccda306f2b	no	10
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27	Non Patent Literature	ITUh233.pdf	3203370 52631bf0f90ec913c59f521cd009f2355669606c	no	18
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28	Non Patent Literature	itsinternational.pdf	111819 13cbc9c6fa37853e7d7c04f75da9027b3e1f59c0	no	1
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29	Non Patent Literature	lifehackerboxqueue.pdf	185662 6a233965802823c338f8ff0e24c630207a3973bc	no	2
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30	Non Patent Literature	linksyswirelessbmediaadapter5pgs.pdf	2340569 6c2c7e0b621be3ea0dd944ccda8eea88fb76f160	no	5
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32	Non Patent Literature	linksysenjoyyourdigitalmusic.pdf	697271 4b151e553e2b50e32e2932dc6970e9b427e25a56	no	4
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33	Non Patent Literature	microsoftchapter8multimediafileformats.pdf	4446902 0e0f634f7eb931b146b12f25208e3bc0b617d43e	no	23
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34	Non Patent Literature	microsoftmediaplatformv25.pdf	81205 45cef038cf2e2f84a1e1282acb3543c779379948	no	2
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35	Non Patent Literature	microsoftmediaplatformv11.pdf	107999 8f5a2e8b6cf1e26b5ceb022560614c7a014a8dd6	no	2
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36	Non Patent Literature	microsoftwindowsfreq.pdf	2782450 09496e9a291608f7f3b76f5bc26ea0d880fd57c0	no	6
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Information:					

37	Non Patent Literature	microsoftxpmediacentereditio n2005features4pgs.pdf	484145 fa9d7da793777800804761e066128bdbc89 81e21	no	4
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Information:					
38	Other Reference-Patent/App/Search documents	OACN2008801275964.pdf	1442033 214b46621dff0619b29f5bd2c4b8363c50e6 d58cf	no	15
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39	Other Reference-Patent/App/Search documents	OAUS13223210.pdf	2317939 c97d5350458062a4b958c08a21c349a7aff1 bf1f	no	14
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40	Other Reference-Patent/App/Search documents	OAUS14564003.pdf	5361494 cd9cd62527708004761a16b0aad2062540d 869c2	no	28
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41	Non Patent Literature	opendml29p.pdf	7221207 b3f274f79de713ebd863ff646a8edb987b87 6771	no	29
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42	Non Patent Literature	pcworldfuturegear.pdf	324560 6a57571697d805c1801d129972a7ca30e06 30672	no	2
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43	Non Patent Literature	qtv.pdf	46452 7979927ea7ace3b7848c82a381efac118f69 3fd0	no	1
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Information:					

44	Other Reference-Patent/App/Search documents	suppepsearchrprt04813918.pdf	122112 90565c571f7bddd828318ee5a1349eb13f7b5f70	no	3
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46	Other Reference-Patent/App/Search documents	suppsearchrprt11774529.pdf	200640 980e1fe65f644db42d50067c418243a135e05887	no	2
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47	Other Reference-Patent/App/Search documents	US2007063950suppesr.pdf	299182 0fd533cad3b9957033dd1abdaaa7dbe551cf54f1	no	8
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48	Non Patent Literature	windowsmediacenterextenderforxbox2pgs.pdf	322710 f9a0843c918af302f75b930607b988299d08d55f	no	2
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50	Other Reference-Patent/App/Search documents	invitationtopayaddlfeesPCT1439852.pdf	133887 75267e105cd76151bb965b885475afac0859ab78	no	2
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51	Non Patent Literature	3gpp.pdf	942502 0a1d25f7bf75584ab7209907a8cf1f9973168b87	no	72
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52	Non Patent Literature	adaptivestreamingcomparison.pdf	208938 52d5a8263d4e09aa722be6952b041de34b1ab6d2	no	5
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Information:					
53	Non Patent Literature	bestpracticesformultidevicetranscoding.pdf	2984351 7e5ab4100df2935e4551af057342b50b97484823	no	13
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Information:					
54	Non Patent Literature	containerformat.pdf	1070478 9027684314c8c87fe32f4bc8b118185132050d7b	no	4
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Information:					
55	Non Patent Literature	diagrammatroska.pdf	3651872 3923ec63a5ff528a93aa431d55f7fb553b355545	no	5
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56	Other Reference-Patent/App/Search documents	063950.pdf	911344 1857fe528c4e0271d0a8348e61bb5ba33cf3af36	no	6
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57	Other Reference-Patent/App/Search documents	046588.pdf	1028227 2c89dabc21aa6feaadb4df61ac7f8883169ae724	no	5
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Information:					

58	Transmittal Letter	02359acon5xtmlpart4.pdf	106652 00b034e8b28aa377fc0d476ad89593347dd0c5e3	no	2
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Information:					
59	Information Disclosure Statement (IDS) Form (SB08)	02359acon5sb08part4.pdf	136939 7d136620a9279ee0c18220f1ee8f90676db6179f	no	6
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Information:					
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			Total Files Size (in bytes):	120876028	

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.

<u>New Applications Under 35 U.S.C. 111</u>
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.
<u>National Stage of an International Application under 35 U.S.C. 371</u>
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.
<u>New International Application Filed with the USPTO as a Receiving Office</u>
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 COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING TRANSMITTAL OF COPY OF INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (CHAPTER I OF THE PATENT COOPERATION TREATY)
(PCT Rule 44bis.1(c))

To:

BAILEY, David, J.
Kauth, Pomeroy, Peck & Bailey LLP
2400 E. Katella Ave., Suite 1050
Anaheim, CA 92806
ETATS-UNIS D'AMERIQUE

Date of mailing *(day/month/year)*	
18 July 2013 (18.07.2013)	
Applicant's or agent's file reference	IMPORTANT NOTICE
01974AB.PCT	

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2011/066927	22 December 2011 (22.12.2011)	05 January 2011 (05.01.2011)

Applicant
DIVX, LLC. et al

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. +41 22 338 82 70

Authorized officer
Yolaine Cussac

e-mail: pt05.pct@wipo.int

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 01974AB.PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2011/066927	International filing date *(day/month/year)* 22 December 2011 (22.12.2011)	Priority date *(day/month/year)* 05 January 2011 (05.01.2011)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant DIVX, LLC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 12 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	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 Article 35(2) 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

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 10 July 2013 (10.07.2013)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Yolaine Cussac
Facsimile No. +41 22 338 82 70	e-mail: pt05.pct@wipo.int

Form PCT/IB/373 (January 2004)

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)*	20 APR 2012

Applicant's or agent's file reference	FOR FURTHER ACTION
01974AB.PCT	See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 11/66927	22 December 2011 (22.12.2011)	05 January 2011 (05.01.2011)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 15/16 (2012.01)
USPC - 709/231

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	03 April 2012 (03.04.2012)	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 11/66927

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:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/66927

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	1-66	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-66	NO
Industrial applicability (IA)	Claims	1-66	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-66 lack an inventive step under PCT Article 33(3) as being obvious over US 2010/0189183 A1 to Gu et al. (hereinafter Gu) in view of US 2007/0168541 A1 to Gupta et al. (hereinafter Gupta).

Regarding claim 1, Gu teaches a playback device configured to perform adaptive bitrate streaming (a multiple bit rate video encoder encodes a plurality of video streams for multiple bit rate video streaming with an objective of providing a more consistent video quality, para [0008]) using a plurality of alternative streams of encoded video packaged within extensible binary markup language (EBML) container files (utilizes the motion information to perform inter-frame coding of the predicted frames of the video content. The encoding can be performed according to a known video encoding standard, such as Windows Media Video format, SMPTE 421-M format, MPEG-x format (e.g., MPEG-1, MPEG-2, or MPEG-4), H.26.times. format (e.g., H.261, H.262, H.263, or H.264), or other format, para [0026]), where each of the plurality of alternative streams is the same source video encoded using different encoding parameters in such a way that each portion of encoded video packed into an element of an EBML container file (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]) commences with an intra frame starting a closed Group of Pictures (GOP) and each of the EBML container files includes at least one element that specifies the encoding parameters of the stream contained within the EBML container file (Video streams at intermediate bit rates are encoded at progressively decreasing variable bit rates (subject to decreasing peak and average bit rate constraints), para [0008]), the playback device comprising: a processor configured, via a client application, to request portions of files from a remote server (a server 110 (e.g., a server computer system such as a standard HTTP server) provides multimedia content to a client 120 (e.g., a client computer system, such as a laptop or desktop computer, or another type of computing device, such as a PDA or mobile phone) via a network, para [0020]); wherein the client application further configures the processor to: retrieve top level index data that identifies a plurality of EBML container files and describes at least a maximum bitrate of the alternative streams contained within the EBML container files (top MBR video stream (generally having highest overall bit rate), the video encoder 200 encodes the video stream with a varying bit rate constrained to fall under a specified peak bit rate while satisfying a specified average bit rate. For the bottom MBR stream (generally having the lowest bit rate of the set), the video encoder uses a constant chunk rate approach. In the context of the multiple bit rate video streaming system, the term chunk refers to a group of pictures (GOP) into which the video stream are segmented, para [0042]); request a portion of at least one of the EBML container files that contains the at least one element that specifies the encoding parameters of the stream contained within the EBML container file (divides video of a multimedia program into multiple streaming segments, and contains a number of compressed bit streams representing the video segments at various bit rates, para [0020]); retrieve an index that references each element containing portions of encoded video within at least one of the EBML container files (the indexed file for multi bit rate streaming can be used by standard HTTP servers to serve multimedia content at multiple bit rates with bit rate selection (rate control) being performed client-side (e.g., exclusively client-side). Clients can perform rate control by first obtaining index information from the server describing the various bit rates available for streaming segments of a program, para [0022]); utilize the index to request portions of a first EBML container file that includes elements that contain portions of encoded video (divided into temporal chunks called streaming segments (self-contained units). The server stores each streaming segment at one or more bit rates (e.g., each streaming segment--bit rate combination is a separate streaming segment encoding). Each streaming segment includes one or more available bit rate encodings for a specific track, para [0024]); receive and buffer the requested elements (Based on the index information, and possibly other information (e.g., network bandwidth, buffer information, etc.), the client can decide which bit rate streaming segments to download from the server to provide a desired user experience, para [0022]); decode the encoded video contained within the buffered elements utilizing the encoding parameters (the video streams at the multiple bit rates can all be decoded and scaled to this same final display resolution in order to achieve a glitch free video presentation, para [0006]). Gu does not expressly teach parse the top level index data to obtain information identifying the plurality of EBML container files; measure current streaming conditions; and select another of the EBML container files from which to retrieve elements containing portions of encoded video for decoding, where the selection is based upon the measured streaming conditions and the description of the bitrate of the alternative stream contained within the top level data. However Gupta, in an analogous art, teaches parse the top level index data to obtain information identifying the plurality of EBML container files (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]); measure current streaming conditions (the server 110 can measure the time between client reads of successive 64 kB chunks of content. This is a reasonable measurement of client 105 throughput because the standard internet networking architecture (routers, switches, etc.) have very small

---continued in supplemental box---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/66927

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
Box No. V.2. Citations and explanations.

Claim 1 (continued): buffers, and thus, the rate at which the client is reading can be estimated in this way. The amount of network buffering may also be able to be determined by keeping statistics and probing each client's destination network or sub-net. Other factors that affect client networking speed (such as the required retransmission of TCP/IP network packets) can be known, measured, and accounted for as well, to give a more accurate estimation of client read speed, para [0080]); and select another of the EBML container files from which to retrieve elements containing portions of encoded video for decoding, where the selection is based upon the measured streaming conditions and the description of the bitrate of the alternative stream contained within the top level data (Once the sending rate is adjusted 1060, the server 110 returns to selecting 1020 the next portion of content, modifying 1030 the content if necessary, and writing 1040 the portion to output. Following the writing 1040 step, the server 110 next determines 1070 whether more instructions apply to the requested media content. If the request includes more instructions, steps 1020-1040 repeat according to the next instruction. Once all instructions are processed and the altered media shot is formed from the selected frames, the server 110 serves 1080 any remaining portion of the combined media shot to the client , para [0083]). It would have been obvious to one skilled in the art to combine the teachings of Gu with those of Gupta in order to more efficiently adapt to multiple streaming bit rates in the video playback system of Gu (see Gupta para [0003]-[0004]).

Regarding claim 2, Gu further teaches wherein: each of the EBML container files comprises a plurality of Cluster elements, where each Cluster element contains a portion of encoded video (term chunk refers to a group of pictures (GOP) into which the video stream are segmented, and define the level of granularity at which the video streaming system may switch playing individual segments between video streams. The constant chunk rate approach enables the video streaming system to guarantee predictability of streaming, para [0042]); and the portion of encoded video in each of the Cluster elements commences with an intra frame and includes at least one closed group of pictures (video encoder then performs intra-frame coding of reference frames of the video content, and utilizes the motion information to perform inter-frame coding of the predicted frames of the video content, para [0026]).

Regarding claim 3, Gu further teaches wherein the portions of encoded video in each of the Cluster elements have the same duration (constant chunk rate approach enables the video streaming system to guarantee predictability of streaming, in that when the lowest bit rate or quality video stream is streamed, the client will receive the chunk amount of pictures at the constant rate so as to maintain minimum quality continuous playing of the video, para [0042]).

Regarding claim 4, Gupta further teaches wherein the portions of encoded video in each of the Cluster elements have a 2 second duration (request also includes a time range for each shot, specified as the starting time (e.g., in seconds into the content) and length (e.g., in seconds). For example, for shot 1, the starting time is 10 seconds (begin=10) and the length is 8 seconds (len=8). The request also includes an edit list that refers to a list of instructions for interleaving the four streams from shots 1-4, such that the new piece of content includes the video of each of shots 1-3 and the audio of shot, para [0055]).

Regarding claim 5, Gu further teaches wherein each Cluster element contains a time code and each encoded frame of the portion of encoded video contained within the Cluster element is contained within a separate BlockGroup element (Between marked boundaries of a video sequence (sequence mark-in and sequence mark-out positions), the MBR encoding process 300 further determines a total number of group of pictures segments in which to divide the video sequence within user-specified constraints (such as a specified average GOP length and maximum allowed GOP length within a scene) and sets boundaries of each group of pictures, para [0046]).

Regarding claim 6, Gu further teaches wherein the first BlockGroup element in the Cluster element contains the intra frame (MBR engine controls the video encoder to produce an encoding of the video stream to meet the constant chunk rate constraint, which helps guarantee client side predictability for playing the streamed video. In intermediate video streams, the MBR engine causes the video encoder to encode the source video with encoding parameters to produce the video stream a variable bit rate falling within maximal peak and average bit rate constraints for the respective intermediate stream, para [0047]).

Regarding claim 7, Gupta further teaches wherein the first BlockGroup element contains a Block element, which specifies the time code attribute of the intra frame relative to the time code of the Cluster element (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks, para [0022]).

Regarding claim 8, Gu further teaches wherein each of the alternative streams of encoded video is encoded at a different maximum bitrate (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]).

Regarding claim 9, Gupta further teaches wherein at least two of the alternative streams of encoded video are encoded at the same display aspect ratio, but with different resolutions using different sample aspect ratios (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 10, Gupta further teaches wherein the at least one element in each of the EBML container files that specifies the encoding parameters of the stream contained within the EBML container file specifies the frame height, frame width and sample aspect ratio of the video stream contained within the EBML container file (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

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Regarding claim 11, Gupta further teaches wherein the client application configures the processor to set the frame height, frame width, and sample aspect ratio prior to commencing the decoding of encoded video contained within buffered elements from one of the EBML container files (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 12, Gu further teaches wherein at least two of the alternative streams of encoded video are encoded at different frame rates (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]).

Regarding claim 13, Gupta further teaches wherein the at least one element in each of the EBML container files that specifies the encoding parameters of the stream contained within the EBML container file specifies the frame rate of the video stream contained within the EBML container file (In addition, the server 110 stores the relevant header and footer information, such as video resolution and frame rate, byte range of the portion of the file that is being composed, and other file format specific information, para [0040]).

Regarding claim 14, Gupta further teaches wherein the client application configures the processor to set the frame rate prior to commencing the decoding of encoded video contained within buffered elements from one of the EBML container files (In addition, the server 110 stores the relevant header and footer information, such as video resolution and frame rate, byte range of the portion of the file that is being composed, and other file format specific information, para [0040]).

Regarding claim 15, Gu further teaches wherein the client application configures the playback device to request portions of files from remote servers via Hypertext Transfer Protocol (HTTP) byte range requests (the indexed file for multi bit rate streaming can be used by standard HTTP servers to serve multimedia content at multiple bit rates with bit rate selection (rate control) being performed client-side (e.g., exclusively client-side). Clients can perform rate control by first obtaining index information from the server describing the various bit rates available for streaming segments of a program, para [0022]).

Regarding claim 16, Gupta further teaches wherein the top level index data is SMIL data and the information that identifies the plurality of EBML container files is a plurality of Universal Resource Indicators that identify the location of each of the EBML container files (instructions are converted into a request from the client for the edited content, for example in the form of a URL as described in conjunction with FIGS. 4A-C, which is sent to the server, para [0068]).

Regarding claim 17, Gu further teaches wherein the SMIL data specifies the maximum bitrate of the encoded stream contained within the EBML container file identified by each of the URLs (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]).

Regarding claim 18, Gupta further teaches wherein: the index that references each of the elements containing portions of the encoded stream within the EBML container file is located within at least one element of the EBML container file (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]); the SMIL file specifies the portions of the EBML container file that contain the elements that contain the encoding parameters (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]); the client application further configures the processor to: parse the SMIL file to identify the portions of the EBML container file that contain the elements that contain the encoding parameters; and request the portions of the EBML container file that contain the elements that contain the encoding parameters (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]).

Regarding claim 19, Gupta further teaches wherein: each EBML container file includes at least one element containing an index that references each element containing portions of encoded video within the EBML container file; and the client application configures the processor to retrieve the index that references each element containing portions of encoded video within an EBML container file by requesting the portion of the EBML container file that includes the at least one element containing the index (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]).

Regarding claim 20, Gupta further teaches wherein the index is located within a Cues element within the EBML container file (computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index 130, which can be queried using a content identifier, para [0022]).

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Regarding claim 21, Gupta further teaches wherein the Cues element includes a plurality of CuePoint elements that include a time attribute and point to the location of each element containing a portion of encoded video within the EBML file (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]).

Regarding claim 22, Gupta further teaches wherein the client application configures the processor to: search for the location of an element containing a specific portion of encoded video within the EBML file using the time attributes of the CuePoint elements within the index; and request a portion of the EBML file including at least the element identified using the CuePoint elements (computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index 130, which can be queried using a content identifier, para [0022]).

Regarding claim 23, Gupta further teaches wherein the encoding parameters utilized to decode the encoded video include at least one encoding parameter selected from the group consisting of frame rate, frame height, frame width, sample aspect ratio, maximum bitrate, and minimum buffer size (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 24, Gupta further teaches wherein the client application configures the processor to measure the current streaming conditions by measuring the time taken to receive requested elements from the time at which the elements were requested (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]).

Regarding claim 25, Gu further teaches wherein: the client application configures the processor to initially request a portion of a first EBML container file containing at least one element that specifies the encoding parameters of the stream contained within the first EBML container file (a server 110 (e.g., a server computer system such as a standard HTTP server) provides multimedia content to a client 120 (e.g., a client computer system, such as a laptop or desktop computer, or another type of computing device, such as a PDA or mobile phone) via a network, para [0020]); and the client application further configures the processor to request a portion of a second EBML container file containing at least one element that specifies the encoding parameters of the stream contained within the second EBML container file, when the client application selects to retrieve elements containing portions of encoded video for decoding from the second EBML container file based upon the measured streaming conditions and the description of the bitrate of the alternative stream contained within the top level index (divides video of a multimedia program into multiple streaming segments, and contains a number of compressed bit streams representing the video segments at various bit rates, para [0020]).

Regarding claim 26, Gu further teaches wherein the playback device is further configured to perform adaptive bitrate streaming using an EBML container file that contains a trick play track (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 27, Gu further teaches wherein the client application configures the processor to select the EBML container file containing the trick play track as the EBML container file from which to retrieve elements containing portions of encoded video in response to a user instruction (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 28, Gu further teaches wherein the playback device is further configured to perform adaptive streaming using at least one EBML container file containing a track of encoded audio (a multiple bit rate video encoder encodes a plurality of video streams for multiple bit rate video streaming with an objective of providing a more consistent video quality, para [0008]).

Regarding claim 29, Gu further teaches wherein the client application configures the processor to retrieve and decode encoded audio from one of the at least one EBML container files containing an audio track and to synchronize the decoded audio with the decoded video (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

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Regarding claim 30, Gu further teaches wherein each of the EBML container files includes elements containing at least one track of encoded audio multiplexed with the encoded video (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 31, Gu further teaches wherein the client application is configured to: retrieve portions of the EBML file containing elements that include portions of one of the tracks of encoded audio (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]); decode the retrieved encoded audio; and synchronize the decoded audio and the decoded video (For audio, the input device(s) 650 may be a sound card or similar device that accepts audio input in analog or digital form, or a CD-ROM reader that provides audio samples to the computing environment, para [0066]).

Regarding claim 32, Gu further teaches wherein the playback device is further configured to perform adaptive streaming using at least one EBML container file containing a subtitle track (a multiple bit rate video encoder encodes a plurality of video streams for multiple bit rate video streaming with an objective of providing a more consistent video quality, para [0008]).

Regarding claim 33, Gupta further teaches wherein the client application configures the processor to: subtitle track; retrieve subtitles from one of the at least one EBML container files containing a synchronize the subtitle with the decoded video (This process ensures that the total duration of video and audio content is identical in each stream. Another example of data interleaving is mixing a text or metadata stream, e.g., closed captioning or promotional data, with an existing audio and/or video stream, para [0047]); and overlay the subtitle over the decoded video (may include other data associated with the video content such as program guide information, metadata, and closed captioning text, para [0023]).

Regarding claim 34, Gupta further teaches wherein each of the EBML container files includes elements containing at least one subtitle track multiplexed with the encoded video (This process ensures that the total duration of video and audio content is identical in each stream. Another example of data interleaving is mixing a text or metadata stream, e.g., closed captioning or promotional data, with an existing audio and/or video stream, para [0047]).

Regarding claim 35, Gupta further teaches wherein the client application is configured to: retrieve portions of the EBML file containing elements that include portions of one of the subtitle tracks (This process ensures that the total duration of video and audio content is identical in each stream. Another example of data interleaving is mixing a text or metadata stream, e.g., closed captioning or promotional data, with an existing audio and/or video stream, para [0047]); synchronize the subtitles with the decoded video; and overlay the subtitles on the decoded video (may include other data associated with the video content such as program guide information, metadata, and closed captioning text, para [0023]).

Regarding claim 36, Gu teaches a method of performing adaptive bitrate streaming of media on a playback device (a multiple bit rate video encoder encodes a plurality of video streams for multiple bit rate video streaming with an objective of providing a more consistent video quality, para [0008]) using a plurality of alternative streams of encoded video packaged within extensible binary markup language (EBML) container files (utilizes the motion information to perform inter-frame coding of the predicted frames of the video content. The encoding can be performed according to a known video encoding standard, such as Windows Media Video format, SMPTE 421-M format, MPEG-x format (e.g., MPEG-1, MPEG-2, or MPEG-4), H.26.times. format (e.g., H.261, H.262, H.263, or H.264), or other format, para [0026]), where each of the alternative streams of video is the same source video encoded using different encoding parameters in such a way that each portion of encoded video packed into an element of an EBML container file (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]) commences with an intra frame starting a closed Group of Pictures (GOP) and each of the EBML container files includes at least one element that specifies the encoding parameters of the stream contained within the EBML container file (Video streams at intermediate bit rates are encoded at progressively decreasing variable bit rates (subject to decreasing peak and average bit rate constraints), para [0008]), the method comprising: retrieving top level index data that identifies each of the plurality of EBML container files and describes at least the maximum bitrate of each of the alternative streams contained within the EBML container files (generally having highest overall bit rate), the video encoder 200 encodes the video stream with a varying bit rate constrained to fall under a specified peak bit rate while satisfying a specified average bit rate. For the bottom MBR stream (generally having the lowest bit rate of the set), the video encoder uses a constant chunk rate approach. In the context of the multiple bit rate video streaming system, the term chunk refers to a group of pictures (GOP) into which the video stream are segmented, para [0042]); requesting a portion of at least one of the EBML container files that contains the at least one element that specifies the encoding parameters of the stream contained within the EBML container file (divides video of a multimedia program into multiple streaming segments, and contains a number of compressed bit streams representing the video segments at various bit rates, para [0020]); retrieving an index that references each element containing portions of encoded video within at least one of the EBML container files (the indexed file for multi bit rate streaming can be used by standard HTTP servers to serve multimedia content at multiple bit rates with bit rate selection (rate control) being performed client-side (e.g., exclusively client-side). Clients can perform rate control by first obtaining index information from the server describing the various bit rates available for streaming segments of a program, para [0022]); utilizing the index to request portions of a first EBML container file that includes elements that contain portions of encoded video (divided into temporal chunks called streaming segments (self-contained units). The server stores each

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Claim 36 (continued): streaming segment at one or more bit rates (e.g., each streaming segment--bit rate combination is a separate streaming segment encoding). Each streaming segment includes one or more available bit rate encodings for a specific track, para [0024]), receiving and buffering the requested elements (Based on the index information, and possibly other information (e.g., network bandwidth, buffer information, etc.), the client can decide which bit rate streaming segments to download from the server to provide a desired user experience, para [0022]); decoding the encoded video contained within the buffered elements utilizing the encoding parameters (the video streams at the multiple bit rates can all be decoded and scaled to this same final display resolution in order to achieve a glitch free video presentation, para [0006]). Gu does not expressly teach parsing the top level index data to obtain information identifying the plurality of EBML container files; measuring current streaming conditions; and selecting another of the EBML container files from which to retrieve elements containing portions of encoded video for decoding, where the selection is based upon the measured streaming conditions and the description of the bitrate of the alternative stream contained within the top level index data. However Gupta, in an analogous art, teaches parsing the top level index data to obtain information identifying the plurality of EBML container files (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]); measuring current streaming conditions (the server 110 can measure the time between client reads of successive 64 kB chunks of content. This is a reasonable measurement of client 105 throughput because the standard internet networking architecture (routers, switches, etc.) have very small buffers, and thus, the rate at which the client is reading can be estimated in this way. The amount of network buffering may also be able to be determined by keeping statistics and probing each client's destination network or sub-net. Other factors that affect client networking speed (such as the required retransmission of TCP/IP network packets) can be known, measured, and accounted for as well, to give a more accurate estimation of client read speed, para [0080]); and selecting another of the EBML container files from which to retrieve elements containing portions of encoded video for decoding, where the selection is based upon the measured streaming conditions and the description of the bitrate of the alternative stream contained within the top level index data (Once the sending rate is adjusted 1060, the server 110 returns to selecting 1020 the next portion of content, modifying 1030 the content if necessary, and writing 1040 the portion to output. Following the writing 1040 step, the server 110 next determines 1070 whether more instructions apply to the requested media content. If the request includes more instructions, steps 1020-1040 repeat according to the next instruction. Once all instructions are processed and the altered media shot is formed from the selected frames, the server 110 serves 1080 any remaining portion of the combined media shot to the client , para [0083]). It would have been obvious to one skilled in the art to combine the teachings of Gu with those of Gupta in order to more efficiently adapt to multiple streaming bit rates in the video playback system of Gu (see Gupta para [0003]-[0004]).

Regarding claim 37, Gu teaches a source encoder configured to encode source video (a multiple bit rate video encoder encodes a plurality of video streams for multiple bit rate video streaming with an objective of providing a more consistent video quality, para [0008]) as a plurality of alternative video streams packed in container files , where the container files are extensible binary markup language (EBML) files, the source encoder comprising:a processor configured via a source encoding application to ingest at least one multimedia file containing a source video (utilizes the motion information to perform inter-frame coding of the predicted frames of the video content. The encoding can be performed according to a known video encoding standard, such as Windows Media Video format, SMPTE 421-M format, MPEG-x format (e.g., MPEG-1, MPEG-2, or MPEG-4), H.26.times. format (e.g., H.261, H.262, H.263, or H.264), or other format, para [0026]); wherein the source encoding application further configures the processor to: select a portion of the source video (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]); transcode the selected portion of the source video into a plurality of alternative portions of encoded video, where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame starting a closed Group of Pictures (GOP) (Video streams at intermediate bit rates are encoded at progressively decreasing variable bit rates (subject to decreasing peak and average bit rate constraints), para [0008]); write each of the alternative portions of encoded video to an element of a different EBML container file, where each element is located within an EBML container file that also includes another element that indicates the encoding parameters used to encode the alternative portion of encoded video (a server 110 (e.g., a server computer system such as a standard HTTP server) provides multimedia content to a client 120 (e.g., a client computer system, such as a laptop or desktop computer, or another type of computing device, such as a PDA or mobile phone) via a network, para [0020]). Gu does not expressly teach add an entry to at least one index that identifies the location of the element containing one of the alternative portions of encoded video within each of the EBML container files. However Gupta, in an analogous art, teaches add an entry to at least one index that identifies the location of the element containing one of the alternative portions of encoded video within each of the EBML container files (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]). It would have been obvious to one skilled in the art to combine the teachings of Gu with those of Gupta in order to more efficiently adapt to multiple streaming bit rates in the video playback system of Gu (see Gupta para [0003]-[0004]).

Regarding claim 38, Gu further teaches wherein transcoding a selected portion of the source video further comprises transcoding the selected portion into at least one closed group of pictures (term chunk refers to a group of pictures (GOP) into which the video stream are segmented, and define the level of granularity at which the video streaming system may switch playing individual segments between video streams. The constant chunk rate approach enables the video streaming system to guarantee predictability of streaming, para [0042]):

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Claim 38 (continued): and the portion of encoded video in each of the Cluster elements commences with an intra frame and includes at least one closed group of pictures (video encoder then performs intra-frame coding of reference frames of the video content, and utilizes the motion information to perform inter-frame coding of the predicted frames of the video content, para [0026]).

Regarding claim 39, Gu further teaches wherein the portion of source video is selected based upon the duration of the selected portion of source video (constant chunk rate approach enables the video streaming system to guarantee predictability of streaming, in that when the lowest bit rate or quality video stream is streamed, the client will receive the chunk amount of pictures at the constant rate so as to maintain minimum quality continuous playing of the video, para [0042]).

Regarding claim 40, Gupta further teaches wherein the source encoding application configures the processor to select a portion of the source video having a duration of two seconds (request also includes a time range for each shot, specified as the starting time (e.g., in seconds into the content) and length (e.g., in seconds). For example, for shot 1, the starting time is 10 seconds (begin=10) and the length is 8 seconds (len=8). The request also includes an edit list that refers to a list of instructions for interleaving the four streams from shots 1-4, such that the new piece of content includes the video of each of shots 1-3 and the audio of shot, para [0055]).

Regarding claim 41, Gu further teaches wherein each of the alternative portions of encoded video is encoded with a different maximum bitrate (MBR engine controls the video encoder to produce an encoding of the video stream to meet the constant chunk rate constraint, which helps guarantee client side predictability for playing the streamed video. In intermediate video streams, the MBR engine causes the video encoder to encode the source video with encoding parameters to produce the video stream a variable bit rate falling within maximal peak and average bit rate constraints for the respective intermediate stream, para [0047]).

Regarding claim 42, Gupta further teaches wherein at least two of the alternative portions of encoded video are encoded with different resolutions (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 43, Gupta further teaches wherein at least two of the alternative portions of encoded video are encoded with different frame rates (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 44, Gupta further teaches wherein the element of the EBML container file to which each alternative portion of encoded video is written is a Cluster element containing a time code and the portion of encoded video is contained within BlockGroup elements within the Cluster element (In addition, the server 110 stores the relevant header and footer information, such as video resolution and frame rate, byte range of the portion of the file that is being composed, and other file format specific information, para [0040]).

Regarding claim 45, Gu further teaches wherein each encoded frame of the alternative portion of encoded video contained within the Cluster element is contained within a separate BlockGroup element (Between marked boundaries of a video sequence (sequence mark-in and sequence mark-out positions), the MBR encoding process 300 further determines a total number of group of pictures segments in which to divide the video sequence within user-specified constraints (such as a specified average GOP length and maximum allowed GOP length within a scene) and sets boundaries of each group of pictures, para [0046]).

Regarding claim 46, Gu further teaches wherein the first BlockGroup element in the Cluster element contains the IDR frame (MBR engine controls the video encoder to produce an encoding of the video stream to meet the constant chunk rate constraint, which helps guarantee client side predictability for playing the streamed video. In intermediate video streams, the MBR engine causes the video encoder to encode the source video with encoding parameters to produce the video stream a variable bit rate falling within maximal peak and average bit rate constraints for the respective intermediate stream, para [0047]).

Regarding claim 47, Gupta further teaches wherein the first BlockGroup element contains a Block element, which specifies the time code attribute of the IDR frame relative to the time code of the Cluster element (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks, para [0022]).

Regarding claim 48, Gupta further teaches wherein each element to which each of the alternative portions of encoded video is written is assigned the same time code (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks, para [0022]).

Regarding claim 49, Gupta further teaches wherein the source encoding application further configures the processor to create an index for each of the EBML container files (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 50, Gupta further teaches wherein the source encoding application further configures the processor to add the location of the element containing one of the alternative portions of encoded video within each of the EBML container files to the index for the EBML container file (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

---continued in supplemental box---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

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Supplemental Box

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

Continuation of:
Box No. V.2. Citations and explanations.

Regarding claim 51, Gupta further teaches wherein the source encoding application further configures the processor to pack the index for each EBML container file into the EBML container file (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 52, Gupta further teaches wherein each index comprises a Cues element (computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index 130, which can be queried using a content identifier, para [0022]).

Regarding claim 53, Gupta further teaches wherein each Cues element includes a CuePoint element that points to the location of the element containing one of the alternative portions of encoded video within the EBML file (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]).

Regarding claim 54, Gupta further teaches wherein the source encoding application further configures the processor to create a top level index file that identifies each of the EBML container files (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 55, Gu further teaches wherein the ingested multimedia file also includes source audio (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 56, Gu further teaches wherein the source encoding application configures the processor to multiplex the audio into each of the EBML container files (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 57, Gu further teaches wherein the source encoding application configures the processor to write the audio to a separate EBML container file (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 58, Gu further teaches wherein the source encoding application further configures the processor to transcode at least one of the at least one audio tracks (Video streams at intermediate bit rates are encoded at progressively decreasing variable bit rates (subject to decreasing peak and average bit rate constraints), para [0008]).

Regarding claim 59, Gupta further teaches wherein the ingested multimedia file further comprises subtitles (This process ensures that the total duration of video and audio content is identical in each stream. Another example of data interleaving is mixing a text or metadata stream, e.g., closed captioning or promotional data, with an existing audio and/or video stream, para [0047]).

Regarding claim 60, Gupta further teaches wherein the source encoding application configures the processor to multiplex the subtitles into each of the EBML container files (This process ensures that the total duration of video and audio content is identical in each stream. Another example of data interleaving is mixing a text or metadata stream, e.g., closed captioning or promotional data, with an existing audio and/or video stream, para [0047]).

Regarding claim 61, Gupta further teaches wherein the source encoding application configures the processor to write the subtitles to a separate EBML container file (This process ensures that the total duration of video and audio content is identical in each stream. Another example of data interleaving is mixing a text or metadata stream, e.g., closed captioning or promotional data, with an existing audio and/or video stream, para [0047]).

Regarding claim 62, Gu further teaches wherein the source encoding application further configures the processor to transcode the source video to create a lower frame rate trick play track and to write the trick play track to a separate EBML container file (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/66927

Supplemental Box

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

Continuation of:
Box No. V.2. Citations and explanations.

Regarding claim 63, Gu further teaches wherein the trick play track is also lower resolution than the source video (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 64, Gu further teaches wherein the source encoding application further configures the processor to write the element containing a set of encoding parameters in each of the EBML container files (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 65, Gupta further teaches wherein the set of encoding parameters includes at least one parameter selected from the group consisting of frame rate, frame height, frame width, sample aspect ratio, maximum bitrate, and minimum buffer size (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 66, Gu teaches a method of encoding source video as a plurality of alternative streams packed in extensible binary markup language (EBML) files using a source encoder (utilizes the motion information to perform inter-frame coding of the predicted frames of the video content. The encoding can be performed according to a known video encoding standard, such as Windows Media Video format, SMPTE 421-M format, MPEG-x format (e.g., MPEG-1, MPEG-2, or MPEG-4), H.26.times. format (e.g., H.261, H.262, H.263, or H.264), or other format, para [0026]), the method comprising: repeatedly selecting a portion of the source video using the source encoder (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]); transcoding the selected portion of the source video into a plurality of alternative portions of encoded video using the source encoder, where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame starting a closed Group of Pictures (GOP) (Video streams at intermediate bit rates are encoded at progressively decreasing variable bit rates (subject to decreasing peak and average bit rate constraints), para [0008]); writing each of the alternative portions of encoded video to an element of a different EBML container file using the source encoder, where each element is located within an EBML container file that also includes another element containing a set of encoding parameters corresponding to the encoding parameters used to encode the portion of video (a server 110 (e.g., a server computer system such as a standard HTTP server) provides multimedia content to a client 120 (e.g., a client computer system, such as a laptop or desktop computer, or another type of computing device, such as a PDA or mobile phone) via a network, para [0020]). Gu does not expressly teach adding an entry to at least one index that identifies the location of the element containing one of the alternative portions of encoded video within each of the EBML container files. However Gupta, in an analogous art, teaches adding an entry to at least one index that identifies the location of the element containing one of the alternative portions of encoded video within each of the EBML container files (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]). It would have been obvious to one skilled in the art to combine the teachings of Gu with those of Gupta in order to more efficiently adapt to multiple streaming bit rates in the video playback system of Gu (see Gupta para [0003]-[0004]).

Claims 1-66 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 02357AB.PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2011/067243	International filing date *(day/month/year)* 23 December 2011 (23.12.2011)	Priority date *(day/month/year)* 05 January 2011 (05.01.2011)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant DIVX, LLC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	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 Article 35(2) 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

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 10 July 2013 (10.07.2013)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Athina Nickitas-Etienne e-mail: pt04.pct@wipo.int

Form PCT/IB/373 (January 2004)

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)*	08 MAY 2012

Applicant's or agent's file reference	**FOR FURTHER ACTION** See paragraph 2 below
02357AB.PCT	

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 11/67243	23 December 2011 (23.12.2011)	05 January 2011 (05.01.2011)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04N 7/12 (2012.01)
USPC - 348/404.1

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 Fom 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	24 April 2012 (24.04.2012)	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 11/67243

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:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

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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	1-41	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-41	NO
Industrial applicability (IA)	Claims	1-41	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-6, 19-25, 40 and 41 lack an inventive step under PCT Article 33(3) as being obvious over US 2009/0169181 A1 to Priyadarshi et al. (hereinafter 'Priyadarshi') in view of US 2003/0231863 A1 to Eerenberg et al. (hereinafter 'Eerenberg').

As to claim 1, Priyadarshi discloses a method of performing visual search of encoded media using a trick play stream (see para [0057]-[0058]), where the media is encoded as a plurality of alternative streams used during normal playback (see para [0005], para [0059]) and a trick play stream used during visual search (see para [0057]-[0058]), the method comprising: requesting and buffering portions of video from at least one of the alternative streams using a playback device (see para [0068]-[0070]); decoding the buffered portions of video using a decoder on the playback device (see para [0072]); receiving at least one user instruction directing the playback device to perform a visual search of the media ('The user interface of the media player allows the user to interact with the media file, e.g., provide trick-play requests' see para [0072]); requesting and buffering portions of video from the trick play stream using the playback device (see para [0070]-[0072]); and decoding the buffered portions of the trick play stream using a decoder on the playback device (see para [0072]) but does not specifically disclose buffering portions of video. However, Eerenberg specifically discloses buffering portions of video in para [0155]-[0157]. It would have been obvious to one of ordinary skill in the art to add Eerenberg's method of buffering portions of video to Priyadarshi's method of performing visual search of encoded media using a trick play stream in order to improve user experience during smooth forward and reverse operations, in streaming playback scenarios (Priyadarshi: see para [0059]).

As to claim 2, Priyadarshi discloses a method further comprising measuring the current streaming conditions by measuring the time taken to receive requested portions of a stream from the time at which the portions were requested ('application enhancement tracks are derived from the main content that they are associated with. They are typically encoded to aid the performance of one or more functions related to the content, such as visual-search, or content-preview' see para [0071]-[0075]).

As to claim 3, Priyadarshi discloses a method wherein requesting and buffering portions of video from at least one of the alternative streams using a playback device further comprises requesting and buffering portions of video from at least one of the alternative streams based upon the bitrates of the alternative streams and the measured streaming conditions using a playback device ('better user experience during smooth forward and reverse operations, in both optical as well as streaming playback scenarios' see para [0059]-[0062]).

As to claim 4, Eerenberg discloses a method wherein each frame of the trick play stream is an intra frame starting a closed group of pictures [GOP] (see Abstract).

As to claim 5, Priyadarshi discloses a method wherein: the at least one user instruction specifies the rate and direction of the visual search; and requesting and buffering potions of video from the trick play stream using the playback device further comprises requesting frames from the trick play stream based upon the rate and direction of the visual search specified by the at least one user instruction ('smooth visual-search capability in both the forward and reverse directions' see para [0008]).

As to claim 6, Priyadarshi discloses a method wherein: the alternative streams and the trick play stream are stored in separate container files; and requesting portions of video from a stream further comprising requesting portions of files from remote servers via Hypertext Transfer Protocol [HTTP] byte range requests using the playback device (see para [0070]).

As to claim 19, Eerenberg discloses a method further comprising modifying the time stamps of the buffered portions of the trick play stream prior to providing the portions of the trick play stream to the decoder for decoding (see para [0044]).

As to claim 20, Priyadarshi discloses a method further comprising retrieving a top level index file using the playback device that identifies the alternative streams used during normal playback of the encoded video and identifies the trick play stream used during visual search of the encoded video (see para [0071]-[0073]).

--(Continued in Supplemental Box)--

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
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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 21, Priyadarshi discloses a playback device configured to perform visual search of encoded media using a trick play stream (see para [0057]-[0058]), where the media is encoded as a plurality of alternative streams used during normal playback (see para [0005], para [0059]) and a trick play stream used during visual search (see para [0057]-[0058]), the playback device comprising: a processor configured to communicate with memory, where the processor is configured by a playback client application stored in the memory (see para [0069]-[0070]; wherein the playback client application configures the processor to: request portions of video from at least one of the alternative streams from a remote server and buffer the requested portions of video in memory (see para [0068]-[0070]); decode the buffered portions of video (see para [0072]); receive at least one user instruction directing the playback device to perform a visual search of the media (see para [0057]-[0058]); request portions of video from the trick play stream from a remote server and buffer requested portions of video from the trick play stream (see para [0070]-[0072]); and decode the buffered portions of the trick play stream (see para [0072]) but does not specifically disclose buffering portions of video. However, Eerenberg specifically discloses buffering portions of video in para [0155]-[0157]. It would have been obvious to one of ordinary skill in the art to add Eerenberg's method of buffering portions of video to Priyadarshi's method of performing visual search of encoded media using a trick play stream in order to improve user experience during smooth forward and reverse operations, in streaming playback scenarios (Priyadarshi: see para [0059]).

As to claim 22, Priyadarshi discloses method of encoding source video as a plurality of alternative streams and a trick play stream using a source encoder (see para [0005], para [0057]-[0059]), the method comprising: repeatedly selecting a portion of the source video using the source encoder (see para [0010], para [0040]); transcoding the selected portion of the source video into a plurality of alternative portions of encoded video using the source encoder (see para [0005], para [0040], para [0059]); transcoding the selected portion of the source video into a portion of trick play stream video for inclusion in a trick play stream using the source encoder, where the portion of trick play stream video is encoded at a lower frame rate and a lower resolution than the source video ('The user interface of the media player allows the user to interact with the media file, e.g., provide trick-play requests' see para [0072]-[0073]); writing each of the alternative portions of encoded video to a separate container file using the source encoder (see para [0049]-[0051]); writing the trick play stream to a separate container file using the source encoder (see para [0049]-[0051]); and adding an entry to an index that identifies the location of each frame in the portion of trick play stream video within the container file containing the trick play stream (see para [0071]-[0073]) but does not specifically disclose where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame starting a closed group of pictures [GOP]. However, Eerenberg specifically discloses where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame starting a closed group of pictures [GOP] in Abstract. It would have been obvious to one of ordinary skill in the art to add Eerenberg's method of encoding parameters starting a GOP to Priyadarshi's method of performing visual search of encoded media using a trick play stream as the trick play GOP can be re-used for higher trick play video speeds (Eerenberg: see para [0016]).

As to claim 23, Priyadarshi discloses method wherein transcoding a selected portion of the source video into a portion of trick play stream video further comprises transcoding the selected portion so that each frame is an IOR frame('intra frame' see para [0005]).

As to claim 24, Priyadarshi discloses method wherein the selected portions of source video are selected based upon their duration ('range of encoded video content' see para [0039]).

As to claim 25, Priyadarshi discloses method wherein the selected portions of source video each have a duration of two seconds (see para [0024]-[0025], para [0054]-[0057]).

As to claim 40, Priyadarshi discloses a method further comprising creating a top level index file that identifies each of the container files containing the alternative streams used during normal playback of the encoded video and identifies the container file that includes the trick play stream used during visual search of the encoded video (see para [0070]-[0073]).

As to claim 41, Priyadarshi discloses a source encoder configured to encode source video as a plurality of alternative streams and a trick play stream (see para [0005], para [0057]-[0059]), the source encoder comprising: a processor configured to communicate with memory, the processor configured by a source encoder application stored in memory (see para [0043]); encoder (see para [0010], para [0040]); wherein the source encoder application configures the processor to: repeatedly select a portion of the source video using the source transcode the selected portion of the source video into a plurality of alternative portions of encoded video (see para [0005], para [0040], para [0059]); transcode the selected portion of the source video into a portion of trick play stream video for inclusion in a trick play stream using the source encoder, where the portion of trick play stream video is encoded at a lower frame rate and a lower resolution than the source video('The user interface of the media player allows the user to interact with the media file, e.g., provide trick-play requests' see para [0072]-[0073]); write each of the alternative portions of encoded video to a separate container file using the source encoder (see para [0049]-[0051]); write the trick play stream to a separate container file using the source encoder (see para [0049]-[0051]); and add an entry to an index that identifies the location of each frame in the portion of trick play stream video within the container file containing the trick play stream(see para [0071]-[0073]) but does not specifically disclose where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame starting a closed group of pictures [GOP]. However, Eerenberg specifically discloses where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame starting a closed group of pictures [GOP] in Abstract. It would have been obvious to one of ordinary skill in the art to add Eerenberg's method of encoding parameters starting a GOP to Priyadarshi's method of performing visual search of encoded media using a trick play stream as the trick play GOP can be re-used for higher trick play video speeds (Eerenberg: see para [0016]).

--(Continued in Supplemental Box)--

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/67243

Supplemental Box

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

Box V, 2. Citations and explanations:

Claims 7-18 and 26-39 lack an inventive step under PCT Article 33(3) as being obvious over Priyadarshi in view of Eerenberg and in further view of 2009/0132599 A1 to Soroushian et al. (hereinafter 'Soroushian').

As to claim 7, Priyadarshi & Eerenberg disclose a method wherein the alternative streams and the trick play stream are stored but do not specifically disclose that they are stored in separate Extensible Binary Markup Language [EBML] container files. However, Soroushian discloses a method wherein the alternative streams and the trick play streams are stored in separate Extensible Binary Markup Language [EBML] container files (see para [0030], para [0042]). It would have been obvious to one of ordinary skill in the art to add Soroushian's method of storing streams in separate Extensible Binary Markup Language [EBML] container files to Priyadarshi & Eerenberg's method of performing visual search of encoded media using a trick play stream in order to increase the granularity of pointers or references to the cue points using multiple hierarchical index points (Soroushian: see para [0030]).

As to claim 8, Soroushian discloses a method wherein: each of the EBML container files comprises a plurality of Cluster elements, where each Cluster element contains a portion of encoded video; and the portion of encoded video in each of the Cluster elements commences with an intra frame (see para [0029]-[0030], para [0045]-[0048]).

As to claim 9, Soroushian discloses a method wherein each Cluster element includes at least one closed group of pictures ('Block Group' see para [0048]).

As to claim 10, Soroushian discloses a method wherein the portions of encoded video in each of the Cluster elements of the alternative streams have the same duration ('Cue Time 153' see para [0045]-[0049]).

As to claim 11, Soroushian discloses a method wherein the portions of encoded video in each of the Cluster elements of the alternative streams have a 2 second duration and each of the Cluster element of the trick play stream include 64 frames (see para [0007]-[0010], para [0045]-[0049]).

As to claim 12, Soroushian discloses a method wherein each Cluster element contains a time code and each encoded frame of the portion of encoded video contained within the Cluster element is contained within a separate element ('The implementation of the hierarchy structure can be inclusive or exclusive, meaning that the data in each layer can be repeated in the other layers or each layer may contain unique position information. In addition, the number of elements at each layer of a hierarchy and the total number of layers can be pre-determined, limited based on pre-determined values, or unbounded' see para [0028]-[0029]).

As to claim 13, Eerenberg discloses a method wherein the first element containing a frame in the Cluster element contains the intra frame (see para [0014]-[0015]).

As to claim 14, Soroushian discloses a method wherein the first element containing a frame is a BlockGroup element that contains a Block element, which specifies the time code attribute of the intra frame relative to the time code of the Cluster element (see para [0048]).

As to claim 15, Eerenberg discloses a method wherein all of the elements that contain frames in the Cluster elements of the EBML container file containing the trick play stream contain intra frames (see para [0014]-[0015]).

As to claim 16, Soroushian discloses a method wherein the EBML container file containing the trick play stream includes at least one modified Cues element containing an index that references Clusters elements containing portions of encoded video within the EBML container file and the elements containing frames within the referenced Clusters elements (see para [0029]-[0030], para [0045]-[0048]).

As to claim 17, Soroushian discloses a method further comprising: retrieving the modified Cues element using the playback device; and identifying frames to retrieve from the EBML container file based upon a visual search rate using the Cues element; wherein requesting and buffering potions of video from the trick play stream using the playback device further comprises requesting and buffering elements that contain frames from the EBML container file containing the trick play stream using the playback device (see para [0029]-[0030], para [0045]-[0048]).

As to claim 18, Soroushian discloses a method further comprising updating the size attribute of Cluster elements retrieved by the playback device (see para [0038]-[0039]).

As to claim 26, Priyadarshi & Eerenberg disclose a method wherein the alternative streams and the trick play stream are stored but do not specifically disclose that the container files containing the alternative streams and the trick play stream are Extensible Binary Markup Language [EBML] container files. However, Soroushian discloses a method wherein wherein the container files containing the alternative streams and the trick play stream are Extensible Binary Markup Language [EBML] container files (see para [0030], para [0042]). It would have been obvious to one of ordinary skill in the art to add Soroushian's method of storing streams in separate Extensible Binary Markup Language [EBML] container files to Priyadarshi & Eerenberg's method of performing visual search of encoded media using a trick play stream in order to increase the granularity of pointers or references to the cue points using multiple hierarchical index points (Soroushian: see para [0030]).

--(Continued in Supplemental Box)--

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/67243

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 27, Soroushian discloses a method wherein: the element of the EBML container file to which each alternative portion of encoded video is written is a Cluster element; and each Cluster element to which each of the alternative portions of encoded video is written is assigned the same time code (see para [0029]-[0030], para [0045]-[0048]).

As to claim 28, Soroushian discloses a method wherein the element of the EBML container file to which the portion of trick play stream video is written is a Cluster element (see para [0029]-[0030], para [0045]-[0048]).

As to claim 29, Soroushian discloses a method wherein the frames of each portion of encoded video are contained within elements within the Cluster element (see para [0029]-[0030], para [0045]-[0048]).

As to claim 30, Soroushian discloses a method wherein the first element that contains a frame in the Cluster element contains the intra frame (see para [0029]-[0030], para [0045]-[0048]).

As to claim 31, Soroushian discloses a method wherein the first element that contains a frame is a BlockGroup element that contains a Block element, which specifies the time code attribute of the intra frame relative to the time code of the Cluster element (see para [0048]).

As to claim 32, Eerenberg discloses a method wherein each frame in the portion of trick play stream video is an intra frame (see para [0014]-[0015]).

As to claim 33, Soroushian discloses a method wherein each element containing a frame in the Cluster element is a BlockGroup element containing the portion of trick play stream video contains a Block element, which specifies the time code attribute of the intra frame relative to the time code of the Cluster element (see para [0048]).

As to claim 34, Soroushian discloses a method wherein adding an entry to an index that identifies the location of each frame in the portion of trick play stream video within the container file containing the trick play stream, further comprises adding the location of each BlockGroup element in the Cluster element containing the portion of trick play stream video to the index for the EBML container file containing the trick play stream (see para [0042]).

As to claim 35, Soroushian discloses a method further comprising packing the index for the EBML container file containing the trick play stream into the EBML container file containing the trick play stream (see para [0042]).

As to claim 36, Soroushian discloses a method wherein each index comprises a Cues element (see para [0042]-[0043]).

As to claim 37, Soroushian discloses a method wherein each Cues element includes a CuePoint element that points to the location of the Cluster element containing the portion of trick play stream video within the EBML file containing the trick play stream; and each CuePoint element comprises a plurality of elements that point to the BlockGroup elements within the Cluster element pointed to by the CuePoint element (see para [0042]-[0047]).

As to claim 38, Soroushian discloses a method further comprising writing an element to each of the EBML container files specifying a set of encoding parameters (see para [0030], para [0042]-[0044]).

As to claim 39, Eerenberg discloses a method wherein the set of encoding parameters includes at least one parameter selected from the group consisting of frame rate, frame height, frame width, sample, aspect ratio, maximum bitrate, and minimum buffer size (see para [0061]]).

Claims 1-41 have industrial applicability as defined by PCT Article 33(4), because the subject matter can be made or used in industry.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference D1-03336.PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2014/030747	International filing date *(day/month/year)* 17 March 2014 (17.03.2014)	Priority date *(day/month/year)* 15 March 2013 (15.03.2013)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant SONIC IP, INC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	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 Article 35(2) 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

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 15 September 2015 (15.09.2015)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Athina Nickitas-Etienne e-mail: pt04.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: David J. Bailey
KPPB LLP
2400 E. Katella, Suite 1050
Anaheim, CA 92806
United States of America

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)* 22 AUG 2014

Applicant's or agent's file reference
D1-03336.PCT

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US14/30747	17 March 2014 (17.03.2014)	15 March 2013 (15.03.2013)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 15/173 (2014.01)
USPC - 709/223, 226

Applicant DIVX, LLC

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.

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	30 July 2014 (30.07.2014)	Shane Thomas 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/US14/30747

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:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/30747

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	2-7, 9-14, 16-21	YES
	Claims	1, 8, 15	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-21	NO
Industrial applicability (IA)	Claims	1-21	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1, 8, and 15 lack novelty under PCT Article 33(2) as being anticipated by US 2012/0124191 A1 (LYON).

As per claim 1, Lyon discloses a system for delivery of content (system for managing TCP anycast requests at content delivery network nodes; abstract; paragraph [0008]), the system comprising: processing circuitry (a processor configured to execute instructions stored on a memory coupled to the processor; paragraph [0008]) configured to: receive a request to stream the content, the request being received from a user equipment device (a request for live video content from an end user is routed by one or more ISP nodes to an appropriate CDN node (receive a request to stream the content, the request being received from a user equipment device); paragraph [0010], [0013]); determine a first location of the user equipment device (an ISP often routes the request to the geographically closest CDN node (determine a first location of the user equipment device); paragraph [0011], [0013]); determine a count of user equipment devices that are located at the first location and are currently streaming the content (requests for content from users are routed to the geographically closest CDN node and determines whether the CDN node has the capacity to service the request based on number of sessions currently being services by the CDN node (determine a count of user equipment devices that are located at the first location and are currently streaming the content); paragraphs [0013], [0014]); determine whether the count meets a threshold (it is determined at the CDN node whether it has the capacity to service the request to the large user base (determine whether the count meets a threshold); paragraphs [0013], [0014]); and responsive to determining that the count meets the threshold, add a first content delivery network to a pool of one or more content delivery networks that are used to stream the content (if CDN node 300 does not have the capacity to handle a new request (responsive to determining that the count meets the threshold), the request is redirected to another CDN node via a virtual tunnel to CDN node 314. CDN node 300 may include virtual tunnels to multiple another nodes of the CDN (add a first content delivery network to a pool of one or more content delivery networks that are used to stream the content); paragraphs [0014], [0015]).

As per claim 8, Lyon discloses a method for delivery of content (process for managing TCP anycast requests at content delivery network nodes; abstract; paragraph [0008]), comprising: receiving a request to stream the content, the request being received from a user equipment device (a request for live video content from an end user is routed by one or more ISP nodes to an appropriate CDN node (receiving a request to stream the content, the request being received from a user equipment device); paragraphs [0010], [0013]); determining a first location of the user equipment device (an ISP often routes the request to the geographically closest CDN node (determining a first location of the user equipment device); paragraphs [0011], [0013]); determining a count of user equipment devices that are located at the first location and are currently streaming the content (requests for content from users are routed to the geographically closest CDN node and determines whether the CDN node has the capacity to service the request based on number of sessions currently being services by the CDN node (determining a count of user equipment devices that are located at the first location and are currently streaming the content); paragraphs [0013], [0014]); determining whether the count meets a threshold (it is determined at the CDN node whether it has the capacity to service the request to the large user base (determining whether the count meets a threshold); paragraphs [0013], [0014]); and responsive to determining that the count meets the threshold, adding, by processing circuitry, a first content delivery network to a pool of one or more content delivery networks that are used to stream the content (if CDN node 300 does not have the capacity to handle a new request (responsive to determining that the count meets the threshold), the request is redirected to another CDN node via a virtual tunnel to CDN node 314 by a processor configured to execute instructions stored on a memory coupled to the processor. CDN node 300 may include virtual tunnels to multiple another nodes of the CDN (adding, by processing circuitry, a first content delivery network to a pool of one or more content delivery networks that are used to stream the content); paragraphs [0008], [0014], [0015]).

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/30747

Supplemental Box

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

-***-Continued from Box V: Citations and Explanations-***-

As per claim 15, Lyon discloses a non-transitory computer-readable medium containing computer-executable instructions that, when executed by a processor, cause the processor to perform a method for delivery of content (a computer program product embodied on a computer readable storage medium; and a processor, such as a processor configured to execute instructions stored on a memory coupled to the processor for managing TCP anycast requests at content delivery network nodes; abstract; paragraph [0008]), the method comprising: receiving a request to stream the content, the request being received from a user equipment device (a request for live video content from an end user is routed by one or more ISP nodes to an appropriate CDN node (receiving a request to stream the content, the request being received from a user equipment device); paragraphs [0010], [0013]); determining a first location of the user equipment device (an ISP often routes the request to the geographically closest CDN node (determining a first location of the user equipment device); paragraphs [0011], [0013]); determining a count of user equipment devices that are located at the first location and are currently streaming the content (requests for content from users are routed to the geographically closest CDN node and determines whether the CDN node has the capacity to service the request based on number of sessions currently being services by the CDN node (determining a count of user equipment devices that are located at the first location and are currently streaming the content); paragraphs [0013], [0014]); determining whether the count meets a threshold (it is determined at the CDN node whether it has the capacity to service the request to the large user base (determining whether the count meets a threshold); paragraphs [0013], [0014]); and responsive to determining that the count meets the threshold, adding a first content delivery network to a pool of one or more content delivery networks that are used to stream the content (if CDN node 300 does not have the capacity to handle a new request (responsive to determining that the count meets the threshold), the request is redirected to another CDN node via a virtual tunnel to CDN node 314. CDN node 300 may include virtual tunnels to multiple another nodes of the CDN (adding a first content delivery network to a pool of one or more content delivery networks that are used to stream the content); paragraphs [0014], [0015]).

Claims 2, 3, 5, 9, 10, 12, 16, 17, and 19 lacks an inventive step under PCT Article 33(3) as being obvious over Lyon in view of US 2007/0271385 A1 to DAVIS et al. (hereinafter "Davis").

As per claims 2, 9, and 16, Lyon discloses the system of claim 1, the method of claim 8, and the non-transitory computer readable medium of claim 15, respectively. However, Lyon does not disclose wherein the first content delivery network includes a first plurality of computing devices that are part of a first data center. Davis discloses wherein the first content delivery network includes a first plurality of computing devices that are part of a first data center (CDN mapping information maps end-user IP blocks to data centers that host CDN regions (content delivery network includes a first plurality of computing devices that are part of a first data center); paragraphs [0039], [0051]). It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified the system, the method, and the non-transitory computer readable medium of Lyon with the teaching of Davis, because by doing so, the system, the method, and the non-transitory computer readable medium of Lyon would enable an end user client to obtain access to contents on different CDN edge servers while preserving a session state.

As per claims 3, 10, and 17, the combination of Lyon and Davis discloses the system of claim 2, the method of claim 9, and the non-transitory computer readable medium of claim 16, respectively. Lyon further discloses the pool includes a second content delivery network (if CDN node 300 does not have the capacity to handle a new request, the request is redirected to another CDN node via a virtual tunnel to CDN node 314. CDN node 300 may include virtual tunnels to multiple another nodes of the CDN (the pool includes a second content delivery network); paragraphs [0014], [0015]). However, Lyon does not disclose the second content delivery network includes a second plurality of computing devices that are part of a second data center; and the second data center is different from the first data center. Davis discloses the second content delivery network includes a second plurality of computing devices that are part of a second data center (CDN mapping information maps end-user IP blocks to data centers that host CDN regions (content delivery network includes a first plurality of computing devices that are part of a first data center); paragraphs [0039], [0051]); and the second data center is different from the first data center (CDN region 500 includes data center 1 and CDN region 502 includes data center 2 (the second data center is different from the first data center); figure 5; paragraph [0045]). It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified the system, the method, and the non-transitory computer readable medium of Lyon with the teaching of Davis, because by doing so, the system, the method, and the non-transitory computer readable medium of Lyon would enable an end user client to obtain access to contents on different CDN edge servers while preserving a session state.

As per claims 5, 12, and 19, Lyon discloses the system of claim 1, the method of claim 8, and the non-transitory computer readable medium of claim 15, respectively. However, Lyon does not disclose wherein determining the first location of the user equipment device includes retrieving at least a portion of a Domain Name Service (DNS) record corresponding to the user equipment device, the portion being indicative of at least one of a network or a network domain the user equipment device is part of. Davis discloses wherein determining the first location of the user equipment device includes retrieving at least a portion of a Domain Name Service (DNS) record corresponding to the user equipment device, the portion being indicative of at least one of a network or a network domain the user equipment device is part of (a request for content is resolved through a CDNSP-managed DNS to identify a best region. When a request for the object is made, a customer's DNS system directs the name query to the CDNSP DNS request routing mechanism (determining the first location of the user equipment device includes retrieving at least a portion of a DNS record corresponding to the user equipment device, the portion being indicative of at least one of a network domain the user equipment device is part of); paragraph [0029]). It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified the system, the method, and the non-transitory computer readable medium of Lyon with the teaching of Davis, because by doing so, the system, the method, and the non-transitory computer readable medium of Lyon would easily identify the location of the device and find the best server for the device.

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/30747

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
-***-Continued from Previous Supplemental Box-***-

Claims 4, 11, and 18 lacks an inventive step under PCT Article 33(3) as being obvious over Lyon in view of US 2011/0191439 A1 to DAZZI et al. (hereinafter "Dazzi").

As per claims 4, 11, and 18, Lyon discloses the system of claim 1, the method of claim 8, and the non-transitory computer readable medium of claim 15, respectively. However, Lyon does not disclose wherein adding the first content delivery network to the pool includes providing an encoder with an identifier of the first content delivery network, the encoder being configured to encode the content to produce encoded content and disseminate the encoded content among content delivery networks in the pool. Dazzi discloses wherein adding the first content delivery network to the pool includes providing an encoder with an identifier of the first content delivery network (the media ingestion system may encode the obtained video file into a format supported by the content distribution system and assign an identifier which may be based on where the media content was stored on the data storage cluster (providing an encoder with an identifier of the content delivery network); paragraphs [0015], [0036]), the encoder being configured to encode the content to produce encoded content and disseminate the encoded content among content delivery networks in the pool (the media ingestion system may encode the obtained video file into a format supported by the content distribution system and replicates across multiple volumes of the data storage cluster based on a set of data which is associated with the media content (the encoder being configured to encode the content to produce encoded content and disseminate the encoded content among content delivery networks in the pool); paragraphs [0036], [0037]). It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified the system, the method, and the non-transitory computer readable medium of Lyon with the teaching of Dazzi, because by doing so, the system, the method, and the non-transitory computer readable medium of Lyon would protect the contents during the transmissions.

Claims 6, 7, 13, 14, 20, and 21 lack an inventive step under PCT Article 33(3) as being obvious over Lyon in view of US 2012/0166633 A1 to Baumback, et al. (hereinafter "Baumback").

As per claims 6, 13, and 20, Lyon discloses the system of claim 1, the method of claim 8, and the non-transitory computer readable medium of claim 15, respectively. However, Lyon does not disclose wherein the first content delivery network is selected from a plurality of available content delivery networks based on a quality of service metric corresponding to the first content delivery network. Baumback discloses wherein the first content delivery network is selected from a plurality of available content delivery networks based on a quality of service metric corresponding to the first content delivery network (the processing device identifies one or more DCN service providers, from a number of CDN service providers, to use in processing a resource request based on CDN selection criteria including CDN quality of service information (wherein the first content delivery network is selected from a plurality of available content delivery networks based on a quality of service metric corresponding to the first content delivery network); paragraphs [0068], [0069]). It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified the system, the method, and the non-transitory computer readable medium of Lyon with the teaching of Baumback, because by doing so, the system, the method, and the non-transitory computer readable medium of Lyon would provide the best quality of service to the users.

As per claims 7, 14, and 21, Lyon discloses the system of claim 1, the method of claim 8, and the non-transitory computer readable medium of claim 15, respectively. However, Lyon does not disclose wherein the first content delivery network is selected from a plurality of available content delivery networks based on a price corresponding to the first content delivery network. Baumback discloses wherein the first content delivery network is selected from a plurality of available content delivery networks based on a price corresponding to the first content delivery network (the processing device identifies one or more DCN service providers, from a number of CDN service providers, to use in processing a resource request based on CDN selection criteria including cost information associated with processing a resource request using a particular CDN (wherein the first content delivery network is selected from a plurality of available content delivery networks based on a price corresponding to the first content delivery network); paragraphs [0068], [0069]). It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified the system, the method, and the non-transitory computer readable medium of Lyon with the teaching of Baumback, because by doing so, the system, the method, and the non-transitory computer readable medium of Lyon would provide services to the users with lower costs.

Claims 1-21 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 59264P/D579	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/US07/63950	International filing date *(day/month/year)* 14 March 2007 (14.03.2007)	Priority date *(day/month/year)* 14 March 2006 (14.03.2006)
International Patent Classification (IPC) or 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 report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 11 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ *(sent to the applicant and to the International Bureau)* a total of 0 sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) _____ , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:
   - ☒ Box No. I Basis of the report
   - ☐ 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 Article 35(2) 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

Date of submission of the demand	Date of completion of this report
	18 December 2009 (18.12.2009)
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer /Kambiz Zand/ Telephone No. (571) 272-3811

Form PCT/IPEA/409 (cover sheet)(April 2007)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US07/63950

Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

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

☐ a translation of the international application into English, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (under Rule 12.4(a))
- ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☒ the international application as originally filed/furnished

☒ the description:
pages 1-20 as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☒ the claims:
pages 21-26 as originally filed/furnished
pages* NONE as amended (together with any statement) under Article 19
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☒ the drawings:
pages 1-12 as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☒ The amendments have resulted in the cancellation of:

- ☒ the description, pages NONE
- ☒ the claims, Nos. NONE
- ☒ the drawings, sheets/figs NONE
- ☒ the sequence listing (*specify*): NONE
- ☒ any table(s) related to the sequence listing (*specify*): NONE

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

5. ☐ This report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 70.2(e)).

** If item 4 applies, some or all of those sheets may be marked "superseded."*

Form PCT/IPEA/409 (Box No. I) (April 2007)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US07/63950

Box No. V Reasoned statement under Article 35(2) 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

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference D1:01167.PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2008/083816	International filing date *(day/month/year)* 17 November 2008 (17.11.2008)	Priority date *(day/month/year)* 16 November 2007 (16.11.2007)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant DIVX, INC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	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 Article 35(2) 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

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis*.2).

	Date of issuance of this report 18 May 2010 (18.05.2010)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Beate Giffo-Schmitt e-mail: pt03.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
KAUTH, POMEROY, PECK & BAILEY LLP
P.O. BOX 19152
IRVINE, CA 92623

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	22 JAN 2009
Applicant's or agent's file reference D1:01167.PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 08/83816	17 November 2008 (17.11.2008)	16 November 2007 (16.11.2007)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 15/16 (2009.01)
USPC - 709/203

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	10 January 2009 (10.01.2009)	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 08/83816

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
   - [X] 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 08/83816

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	1-23	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-23	NO
Industrial applicability (IA)	Claims	1-23	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-23 lack novelty under PCT Article 33(2) as being anticipated by US 2006/0235880 A1 to Qian.

As per claim 1, Qian teaches a method of playing back content by a playback device stored in a media file, the method comprising: providing a media file to a playback device (para [0019]), the media file having content data (para [0020]), cue data (para [0020]) and a hierarchical index (para [0017], [0022]), the content data having a plurality of media frames (para [0020]), the cue data being associated with each frame of the plurality of frames and the hierarchical index being associated with a subset of the cue data (timestamp / offset . para [0037]); decoding the content data by a playback device (para [0019]); displaying content on a display screen from the decoded . content data (para [0053]); receiving a user request (para [0053]); locating the index based on the user request (para [0044]); and decoding one or more media frames from the subset of the cue data based on the located index (para [0044]).

As per claim 2, Qian teaches the method of claim 1 wherein the index has reference values that point directly to particular media frames of the plurality of media frames (para [0037]).

As per claim 3, Qian teaches the method of claim 1 wherein the hierarchical index includes pointers to the cue data within the media file and further comprising accessing the cue data through the pointers to locate a frame to be decoded (para [0021], [0024]).

As per claim 4, Qian teaches the method of claim 1 wherein the hierarchical index is associated with a subset of the plurality of media frames through a second hierarchical index and further comprising locating a subset of the second hierarchical index based on the hierarchical index relative to the user request (Fig. 4, para [0032]).

As per claim 5, Qian teaches the method of claim 4 wherein decoding one or more media frames from the subset of the plurality of media frames is based on the located subset of the second hierarchical index (Fig. 4, para [0032]).

As per claim 6, Qian teaches the method of claim 1 wherein the media file has an upper hierarchical index associated with the hierarchical index and the hierarchical index associated with one or more media frames from the subset of the plurality of media frames and wherein the upper hierarchical index has a greater number of associations with one or more media frames than the hierarchical index (para [0029], [0032], [0042]).

As per claim 7, Qian teaches a method of encoding a media file for playing back by a playback device, comprising: incorporating seek locations with content data (para [0037]), the content data having audio, video and subtitle tracks, the seek locations identifying particular timestamps for particular frames within the audio, video or subtitle tracks; incorporating an index referencing the incorporated seek locations (para [0037]); and creating a media file having the content data, the incorporated seek locations, and the incorporated index (Fig. 3, para [0027]).

As per claim 8, Qian teaches the method of claim 7 wherein incorporating the index further comprises interleaving an index between audio and video tracks (para [0024]).

As per claim 9, Qian teaches the method of claim 8 wherein the index points only to key frames within the audio, video or subtitle tracks (para [0037]).

As per claim 10, Qian teaches the method of claim 9 wherein the index contains locations and timestamps to key frames (para [0037]).

As per claim 11, Qian teaches a system for playback of a media file, comprising: a media server configured to transmit a media file having at least one index having pointers that reference at least one frame of media content within the media file (para [0046]); and a client processor in network communication with the media server and configured to send requests for the media file to the media server (Fig. 9, para [0054]), the media server configured to transmit the media file requested (para [0046]), the client processor comprises a playback engine configured to locate a pointer from the at least one index to locate and decode the portions of the media file based on the located pointer to comply with user playback instructions (Fig. 9, para [0054]).

(See Supplemental Box)

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

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 08/83816

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
Claim 23 refers to Claim 19, but also mentions a "located cluster." Only claim 22 mentions the element of locating a cluster, so it appears that Claim 23 should instead refer to Claim 22.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 08/83816

Supplemental Box

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

Continuation of:
V. 2. Citations and Explanations

As per claim 12, Qian teaches the system of claim 11 wherein the at least one index contains pointers to key frames only (para [0037]).

As per claim 13, Qian teaches the system of claim 11 wherein the at least one index contains pointers to another index that contains pointers that reference at least one frame of media content within the media file (para [0021], [0024]).

As per claim 14, Qian teaches the system of claim 11 wherein the at least one index comprises a plurality of pointers, each pointer referencing a frame of media content and the plurality of pointers in its entirety referencing each frame of media content (para [0037]).

As per claim 15, Qian teaches the system of claim 11 wherein the at least one index comprises a coarse index having pointers referencing frames of media content and a fine index having pointers referencing frame of the media content, the fine index having more pointers than the coarse index (para [0032]).

As per claim 16, Qian teaches the system of claim 11 wherein the at least one index comprises a reduced index having pointers only to access frames of the media content (para [0042]).

As per claim 17, Qian teaches a method of decoding a multimedia file having an index included with the multimedia file, the method comprising: locating an index within a multimedia file (para [0019]), the index having a plurality of index data-points and the multimedia file having a plurality of frames (para [0020]) and a plurality of cue data-points having a time stamp (para [0037]) and a location of a specific frame of the plurality of frames (para [0037]); loading the located index into storage (para [0051]); locating an index data-point from the plurality of index data-points based on a timestamp (para [0044], [0045]); and locating a cue data-point from the plurality of cue-data points based on the located index data-point (para [0019]).

As per claim 18, Qian teaches the method of claim 17 further comprising displaying a video frame on a display screen, the displayed video frame being a frame that corresponds to a frame referenced in the located cue data-point (Fig. 9; para [0046], [0053]).

As per claim 19, Qian teaches the method of claim 18 further comprising playing audio through a speaker system in a synchronized manner relative to the displayed frame and the played audio being based on audio information that corresponds to a beginning of audio data for the displayed frame (para [0017], [0019], [0020]).

As per claim 20, Qian teaches the method of claim 18 further comprising displaying subtitles in a synchronized manner relative to the displayed frame and the displayed subtitles being based on subtitle information that corresponds to subtitle data for the displayed frame (para [0019]).

As per claim 21, Qian teaches the method of claim 18 further comprising displaying metadata information relative to the displayed frame and the displayed metadata information being based on metadata information that corresponds to metadata for the displayed frame (para [0029], [0032], [0044]).

As per claim 22, Qian teaches the method of claim 17 further comprising locating a cluster referenced by the located cue data-point ('cluster' . localized TOC indexes, para [0021]).

As per claim 23, Qian teaches the method of claim 19 further comprising locating a block within the located cluster and referenced by the located cue data-point (para [0021]).

Claims 1-23 have industrial applicability as defined by PCT article 33(4) because the subject matter can be made or used in industry.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference D1:01940.PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2010/056733	International filing date *(day/month/year)* 15 November 2010 (15.11.2010)	Priority date *(day/month/year)* 04 December 2009 (04.12.2009)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant DIVX, LLC		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	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 Article 35(2) 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

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 05 June 2012 (05.06.2012)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Agnès Wittmann-Regis e-mail: pt06.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DAVID J. BAILEY
KAUTH, POMEROY, PECK & BAILEY LLP
2875 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)*	14 JAN 2011
Applicant's or agent's file reference D1:01940.PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 10/56733	15 November 2010 (15.11.2010)	04 December 2009 (04.12.2009)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04N 7/167 (2010.01)
USPC - 380/217

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.

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	03 January 2011 (03.01.2011)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2009)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 10/56733

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 0155
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 10/56733

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	10-12 and 22-25	YES
	Claims	1-9 and 13-21	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-25	NO
Industrial applicability (IA)	Claims	1-25	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-9 and 13-21 lack novelty under PCT Article 33(2) as being anticipated by US 2004/0081333 A1 to Grab et al. (hereinafter 'Grab').

As per claim 1, Grab discloses a method of playing back encrypted video on a playback device, where at least partially encrypted video data (Para [0033] -- selected portions of a stream) is contained within a container file (Para [0033] -- header data; Para [0040] -- tagged, synchronized frame decryption stream) and can be used to create an elementary bitstream using cryptographic information (Para [0033] -- encrypted material), which can be used to decrypt the at least partially encrypted video data (Para [0040]), the method comprising: obtaining the cryptographic information (Para [0040] -- encryption key); extracting the at least partially encrypted video data from the container file to create an elementary bitstream (Para [0038] -- marked frames; Para [0042]); enciphering the cryptographic information (Para [0047]); inserting the cryptographic information in the elementary bitstream (Para [0042], [0047]); providing the elementary bitstream to a video decoder (Para [0048]); extracting the cryptographic information from the elementary bitstream at the video decoder (Para [0048] -- parsing frames); deciphering the cryptographic information (Para [0048] -- decryption routine); decrypting the elementary bitstream with the cryptographic information (Para [0048] -- decrypting with appropriate decryption key); and decoding the elementary bitstream for rendering on a display device using the video decoder (Para [0048], [0052]).

As per claim 13, Grab further discloses a system for playback of encrypted video, where at least partially encrypted video data (Para [0033] -- selected portions of a stream) is contained within a container file (Para [0033] -- header data; Para [0040] -- tagged, synchronized frame decryption stream) and can be used to create an elementary bitstream using cryptographic information (Para [0033] -- encrypted material), which can be used to decrypt the at least partially encrypted video data (Para [0040]), comprising: a demultiplexer configured to extract the at least partially encrypted video data from the container file to create an elementary bitstream (Para [0038] -- marked frames; Para [0042]); and a video decoder configured to decrypt the elementary bitstream using the cryptographic information (Para [0048] -- decrypting with appropriate decryption key) and decode the elementary bitstream for rendering on a display device (Para [0048], [0052]); wherein the demultiplexer is configured to encipher the cryptographic information (Para [0047]) and insert the enciphered cryptographic information in the elementary bitstream (Para [0042], [0047]); and wherein the decoder is configured to extract enciphered cryptographic information from an elementary bitstream (Para [0048] -- parsing frames) and to decipher the cryptographic information (Para [0048] -- decryption routine).

As per claims 2 and 14, Grab further discloses wherein the cryptographic information is obtained from the container file (Para [0040] -- encryption key from synchronized frame decryption stream).

As per claims 3 and 15, Grab further discloses wherein the cryptographic information comprises: key information (Para [0040]); and information concerning at least a portion of the at least partially encrypted video data that is encrypted using the key information (Para [0038], [0040] -- encryption on/off status).

As per claims 4 and 16, Grab further discloses wherein the information concerning at least a portion of the at least partially encrypted video data is a reference to a block of encrypted data within an encoded frame of video that is encrypted using the key information (Para [0040] -- size of data field).

As per claims 5 and 17, Grab further discloses wherein the cryptographic information inserted in the elementary bitstream is delimited by an identifier (Para [0040] -- encryption on/off status); and the cryptographic information is inserted before the at least partially encrypted video data encrypted using the key information (Para [0050] -- frame decryption information).

As per claims 6 and 18, Grab further discloses wherein the cryptographic information is extracted using the identifier (Para [0048] -- parsing frames).

As per claims 7 and 19, Grab further discloses wherein the decrypting process is performed by using the key information to identify the encrypted portion of video data and decrypting the encrypted video data using the key information (Para [0048]).

As per claims 8 and 20, Grab further discloses wherein cryptographic information inserted in different locations within the elementary bitstream includes different key information (Para [0041] -- new key for new partially encrypted video data).

As per claims 9 and 21, Grab further discloses wherein the at least partially encrypted video data comprises: frames of encoded video (Para [0039]); wherein at least a portion of a plurality of the encoded frames is encrypted (Para [0039]).

-- Please See Supplemental Sheet --

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 10/56733

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box V.2 Citations and Explanations

Claims 10-12 and 22-25 lack an inventive step under PCT Article 33(3) as being obvious over Grab in view of US 2003/0035546 A1 to Jiang et al. (hereinafter 'Jiang').

As per claims 10 and 22, Grab does not disclose wherein the enciphering process and the deciphering process are synchronized such that a delay in excess of a predetermined time between enciphering and deciphering results in the cryptographic information being unrecoverable. However, Jiang does disclose wherein the enciphering process and the deciphering process are synchronized such that a delay in excess of a predetermined time between enciphering and deciphering results in the cryptographic information being unrecoverable (Para [0021]). It would have been obvious to one of ordinary skill in the art to have modified Grab so as to include synchronized processes, as taught by Jiang, since such would help protect the encrypted bitstream by recognizing if any additional processes were being performed on the bitstream, thereby extending the delay above the predetermined time, and stopping access to the deciphering process.

As per claims 11 and 23, Grab does disclose wherein the enciphering process enciphers data by using a sequence of scrambling processes to scramble data (Para [0033], [0037], [0055] -- signal processing techniques).

As per claims 12 and 24, Grab does disclose wherein the deciphering process deciphers data by performing the inverse sequence of scrambling processes to the sequence used to scramble the data (Para [0056]).

As per claim 25, Grab further discloses method of playing back encrypted video on a playback device, where at least partially encrypted video data (Para [0033] -- selected portions of a stream) is contained within a container file (Para [0033] -- header data; Para [0040] -- tagged, synchronized frame decryption stream) and can be used to create an elementary bitstream using cryptographic information (Para [0033] -- encrypted material), which can be used to decrypt the at least partially encrypted video data (Para [0040]), the method comprising: obtaining the cryptographic information (Para [0040] -- encryption key), wherein the cryptographic information is obtained from the container file (Para [0040] -- encryption key from synchronized frame decryption stream); wherein the at least partially encrypted video data comprises: frames of encoded video (Para [0039]); and wherein at least a portion of a plurality of the encoded frames is encrypted (Para [0039]); wherein the cryptographic information comprises: key information (Para [0040]); and information concerning at least a portion of the least partially encrypted video data that is encrypted using the key information (Para [0038], [0040] -- encryption on/off status); wherein the information concerning at least a portion of the at least partially encrypted video data is a reference to a block of encrypted data within an encoded frame of video that is encrypted using the key information (Para [0040] -- size of data field); and wherein cryptographic information inserted in different locations within the elementary bitstream includes different key information (Para [0041] -- new key for new partially encrypted video data); extracting the at least partially encrypted video data from the container file to create an elementary bitstream (Para [0038] -- marked frames; Para [0042]), wherein the cryptographic information inserted in the elementary bitstream is delimited by an identifier (Para [0040] -- encryption on/off status); and wherein the cryptographic information is inserted before the at least partially encrypted video data encrypted using the key information (Para [0050] -- frame decryption information); enciphering the cryptographic information (Para [0047]); inserting the cryptographic information in the elementary bitstream (Para [0042], [0047]), wherein the cryptographic information is extracted using the identifier (Para [0048] -- parsing frames); providing the elementary bitstream to a video decoder (Para [0048]); extracting the cryptographic information from the elementary bitstream at the video decoder (Para [0048] -- parsing frames); deciphering the cryptographic information (Para [0048] -- decryption routine), wherein the enciphering process enciphers data by using a sequence of scrambling processes to scramble data (Para [0033], [0037], [0055] -- signal processing techniques); and wherein the deciphering process deciphers data by performing the inverse sequence of scrambling processes in the sequence used to unscramble data (Para [0056]); decrypting the elementary bitstream with the cryptographic information (Para [0048] -- decrypting with appropriate decryption key), wherein the decrypting process is performed by using the key information to identify the encrypted portion of video data and decrypting the encrypted video data using the key information (Para [0048]); and decoding the elementary bitstream for rendering on a display device using the video decoder (Para [0048], [0052]). Grab does not disclose wherein the enciphering process and the deciphering process are synchronized such that a delay in excess of a predetermined time between enciphering and deciphering results in the cryptographic information being unrecoverable. However, Jiang does disclose wherein the enciphering process and the deciphering process are synchronized such that a delay in excess of a predetermined time between enciphering and deciphering results in the cryptographic information being unrecoverable (Para [0021]). It would have been obvious to one of ordinary skill in the art to have modified the method of Grab so as to include synchronized processes, as taught by Jiang, since such would help protect the encrypted bitstream by recognizing if any additional processes were being performed on the bitstream, thereby extending the delay above the predetermined time, and stopping access to the deciphering process.

Claims 1-25 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 0157
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference D1:02359AB.PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2011/068276	International filing date *(day/month/year)* 31 December 2011 (31.12.2011)	Priority date *(day/month/year)* 01 September 2011 (01.09.2011)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant SONIC IP, INC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 23 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	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 Article 35(2) 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

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 04 March 2014 (04.03.2014)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Philippe Bécamel e-mail: pt03.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	08 JUL 2013
Applicant's or agent's file reference D1:02359AB.PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2011/068276	31 December 2011	01 September 2011

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04L 9/18 (2013.01)
USPC - 380/255

Applicant DIVX, LLC

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.

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 June 2013	Blaine R. Copenheaver 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.
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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:

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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	3-13, 16-26, 29-105	YES
	Claims	1, 2, 14, 15, 27, 28	NO
Inventive step (IS)	Claims	None	YES
	Claims	105	NO
Industrial applicability (IA)	Claims	105	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1, 2, 14, 15, 27, 28 lack novelty under PCT Article 33(2) as being anticipated by Amini et al., hereinafter referred to as Amini.

Regarding claim 1, Amini discloses a source encoder (multi-encoder platform 220, para 0031, see fig. 2 [whose components are shown in the computing system of fig. 11, para 0068]), comprising: a processor (processor 1102, para 0068, 0069, see fig. 11); non-volatile storage containing an encoding application (memory 1104 [RAM or ROM (nonvolatile)], para 0068, 0069, see fig. 11); wherein the encoding application configures the processor to: receive source content (a stream source 210 offers unencoded access units [frames] to the encoder, para 0031, see fig. 2); obtain common cryptographic information (encryptor 240 where the streams are encrypted, para 0032, see fig. 2; same key is used for different streams [common cryptographic information], para 0054); encode the source content as a plurality of streams including a plurality of alternative streams of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2); and protect the plurality of alternative streams of content using the common cryptographic information (same key is used for different streams, para 0054, 0044 [protecting the content]).

Regarding claim 14, Amini discloses a method of encoding source content as a plurality of protected streams using common cryptographic information (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2), comprising: receiving source content using a source encoder (a stream source 210 offers unencoded access units [frames] to the encoder, para 0031, see fig. 2); obtaining common cryptographic information using a source encoder (encryptor 240 where the streams are encrypted, para 0032, see fig. 2; same key is used for different streams [common cryptographic information], para 0054); encoding the source content as a plurality of streams including a plurality of alternative streams of content using the source encoder (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2); and protecting the plurality of alternative streams of content using the source encoder and the common cryptographic information (same key is used for different streams, para 0054, 0044 [protecting the content]).

Regarding claim 27, Amini discloses a machine readable medium containing processor instructions (machine readable medium, claim 26; multi-encoder platform 220, para 0031, see fig. 2 [whose components are shown in the computing system of fig. 11, para 0068]), where execution of the instructions by a processor causes the processor to perform a process (processor 1102, para 0068, 0069, see fig. 11) comprising receiving source content using a source encoder (a stream source 210 offers unencoded access units [frames] to the encoder, para 0031, see fig. 2); obtaining common cryptographic information using a source encoder (encryptor 240 where the streams are encrypted, para 0032, see fig. 2; same key is used for different streams [common cryptographic information], para 0054); encoding the source content as a plurality of streams including a plurality of alternative streams of content using the source encoder (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2); and protecting the plurality of alternative streams of content using the source encoder and the common cryptographic information (same key is used for different streams, para 0054, 0044 [protecting the content]).

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Supplemental Box

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

Regarding claims 2 and 15, Amini teaches wherein the encoding application configures the processor to encode and protect the source content by configuring the processor to: encode a portion of source content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2); and encrypt at least one portion of the encoded portion of content so that the at least one encrypted portion can be accessed using the common cryptographic information (same key is used for different streams [which are encrypted using the encryptor 220, para 0032, see fig. 2], para 0054, 0044 [protecting the content]).

Regarding claim 28, Amini discloses wherein the machine readable medium is non-volatile memory (memory 1104 with ROM [non-volatile], para 0068, 0069, see fig. 11).

Claims 29-33, 36-40, 49-53, 56-58 lack an inventive step under PCT Article 33(3) as being obvious over Thorwirth and in view of Schnell and further in view of Amini.

Regarding claim 29, Thorwirth discloses a content distribution system (system for enhancing security of content distribution, para 0018), comprising a content distribution server (content ingested on server 301 part of a content distribution network, para 0052),where the content distribution server stores a plurality of content files containing alternative streams of protected content associated with a title (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),the alternative streams of protected content are protected using cryptographic information (the chunks are protected using different watermark payloads, para 0052), and each content file includes a copy of the cryptographic information 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); wherein a server is configured to: receive a request for access to the alternative streams of protected content associated with the title from a playback device (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]);and securely provide a copy of the at least one encryption key used to encrypt the cryptographic information to 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);and wherein the content distribution server is configured to grant the playback device access to the alternative streams of protected content (server provides access to the client based on the selection or chunks requested, para 0053). Thorwirth lacks the teaching of comprising: a DRM server; a container file; common cryptographic information. 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]). Further, Schnell is in the field of segmented media content rights management (abstract, title) and 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). Furthermore, 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 49, Thorwirth discloses a method of distributing content encoded as a plurality of alternative streams of protected content (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), where the alternative streams of protected content are protected using cryptographic information (the chunks are protected using different watermark payloads, para 0052) and each stream of protected content includes a copy of the cryptographic information 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), the method comprising: receiving a request for access to the alternative streams of protected content associated with the title from a playback device using a server (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]); securely providing to the playback device at least one encryption key using the server (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), where the at least one encryption key is used to access the encrypted cryptographic information (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058); and granting the playback device access to the alternative streams of protected content using a content distribution server (content ingested on server 301 part of a content distribution network, para 0052; server provides access to the client based on the selection or chunks requested, para 0053).Thorwirth lacks the teaching of comprising: a DRM server; a container file; common cryptographic information. 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]). Further, Schnell is in the field of segmented media content rights management (abstract, title) and 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). Furthermore, 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).

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

Regarding claim 30, Thorwirth as modified teaches wherein the server is configured to associate a title ID with the title (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]; the chunks are protected using different watermark payloads, para 0052). Thorwirth lacks the teaching of a DRM server. 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).

Regarding claim 31, Thorwirth teaches wherein server is configured to associate the cryptographic information with the title ID (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]; the chunks are protected using different watermark payloads, para 0052). Thorwirth lacks the teaching of a DRM server and a common cryptographic information. 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). Furthermore, 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 32, Thorwirth teaches wherein the request for access to the alternative streams of protected content associated with the title comprises a request identifying a title ID (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]; the chunks are protected using different watermark payloads, para 0052).

Regarding claim 33, Thorwirth teaches wherein the content distribution server is further configured to: receive requests for portions of at least one container file from the playback device (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]); and provide the requested portions of the at least one container file to the playback device (server provides access to the client based on the selection or chunks requested para 0053).

Regarding claim 36, Thorwirth teaches obtain common cryptographic information from the server (the chunks are protected using different watermark payloads, para 0052); receive source content, encode the source content as a plurality of streams including a plurality of alternative streams of content (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); protect the plurality of alternative streams of content using cryptographic information (the chunks are protected using different watermark payloads, para 0052); protect the cryptographic information 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 provide a plurality of content files containing the plurality of alternative streams of protected content to the content distribution server (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). However, Thorwirth lacks the teaching of a source encoder, common cryptographic information and a DRM server, container files. 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]). Further, Schnell is in the field of segmented media content rights management (abstract, title) and 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). Furthermore, Amini teaches a content distribution source encoder (multi-encoder platform 220, para 0031, see fig. 2 [whose components are shown in the computing system of fig. 11, para 0068]) 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).

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Supplemental Box

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

Regarding claim 37, Thorwirth lacks the teaching wherein the source encoder is configured to: encode a portion of content; and encrypt at least one portion of the encoded content so that the at least one encrypted portion can be accessed using the common cryptographic information. Amini teaches wherein the source encoder is configured to: encode a portion of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2); and encrypt at least one portion of the encoded portion of content so that the at least one encrypted portion can be accessed using the common cryptographic information (same key is used for different streams [which are encrypted using the encryptor 220, para 0032, see fig. 2], 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 38, Thorwirth lacks the teaching wherein the source encoder is configured to write each of the alternative streams of protected content to a separate container file. However, Thorwirth shows wherein the alternative streams of protected content are written into a container file is well known in the art (sections of multiple files are created with pointers within a container file, para 0004, 0010). 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 feature 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).

Regarding claim 39, Thorwirth teaches each stream of protected content includes a copy of the cryptographic information 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), but lacks the teaching wherein the source encoder is configured to process common cryptographic information. 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).

Regarding claim 40, Thorwirth teaches wherein the source encoder is configured to encrypt at least a portion of the cryptographic information using a single encryption key and write the encrypted information to each of the container files containing the alternative streams of protected content (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058), but lacks the teaching wherein the source encoder is configured to process common cryptographic information. 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).

Regarding claim 50, Thorwirth teaches wherein the title is identified using a title ID (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]; the chunks are protected using different watermark payloads, para 0052).

Regarding claim 51, Thorwirth teaches wherein the common cryptographic information is associated with the title ID (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]; the chunks are protected using different watermark payloads, para 0052). 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).

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Regarding claim 52, Thorwirth teaches wherein the request for access to the alternative streams of protected content associated with the title comprises a request identifying a title ID (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]; the chunks are protected using different watermark payloads, para 0052).

Regarding claim 53,Thorwirth teaches receiving requests for portions of at least one container file from the playback device using the content distribution server (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]); and providing the requested portions of the at least one container file to the playback device using the content distribution server (server provides access to the client based on the selection or chunks requested para 0053).

Regarding claim 56, Thorwirth teaches obtain common cryptographic information from the server (the chunks are protected using different watermark payloads, para 0052); receive source content, encode the source content as a plurality of streams including a plurality of alternative streams of content (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); protect the plurality of alternative streams of content using cryptographic information (the chunks are protected using different watermark payloads, para 0052); protect the cryptographic information 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 provide a plurality of content files containing the plurality of alternative streams of protected content to the content distribution server (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). However, Thorwirth lacks the teaching of a source encoder, common cryptographic information and a DRM server, container files. 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]). Further, Schnell is in the field of segmented media content rights management (abstract, title) and 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). Furthermore, Amini teaches a content distribution source encoder (multi-encoder platform 220, para 0031, see fig. 2 [whose components are shown in the computing system of fig. 11, para 0068]) 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 57, Thorwirth lacks the teaching of encoding a portion of content using the source encoder; and encrypting at least one portion of the encoded content using the source encoder so that the at least one encrypted portion can be accessed using the common cryptographic information. Amini teaches wherein the source encoder is configured to: encode a portion of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2); and encrypt at least one portion of the encoded portion of content so that the at least one encrypted portion can be accessed using the common cryptographic information (same key is used for different streams [which are encrypted using the encryptor 220, para 0032, see fig. 2], 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 58, Thorwirth lacks the teaching wherein the source encoder is configured to write each of the alternative streams of protected content to a separate container file. However, Thorwirth shows wherein the alternative streams of protected content are written into a container file is well known in the art (sections of multiple files are created with pointers within a container file, para 0004, 0010). 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 feature 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).

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Claims 67, 69, 84, 86, 103, 105 lack an inventive step under PCT Article 33(3) as being obvious over Thorwirth and in view of Amini.

Regarding claim 67, Thorwirth discloses a playback device (client device or user requests access for playback, para 0053), comprising: a processor (client device is a personal computer 404, mobile phone 406 or consumer electronics device 408 [a processor is inherent], para 0056, see fig. 4); memory containing a client application (client device is a personal computer 404, mobile phone 406 or consumer electronics device 408 [a memory is inherent], para 0056, see fig. 4); wherein the client application configures the processor to: request a file identifying a plurality of alternative streams of protected content (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]),where each of the alternative streams of protected content are encrypted using cryptographic information (the chunks are protected using different watermark payloads, para 0052); request portions of content from at least the plurality of alternative streams of protected content (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]); access the protected content using the cryptographic information (content ingested on server 301 part of a content distribution network, para 0052; server provides access to the client based on the selection or chunks requested, para 0053); and playback the content (playback of content on the client device, para 0053). Thorwirth lacks the teaching of a top level index file obtain the common cryptographic information. However, Thorwirth teaches a top level index file is well known in the art (top level index file pointing to a number of alternate streams that contain actual video and audio data, para 0009). 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).

Regarding claim 84, Thorwirth discloses a method of performing adaptive bitrate streaming using a plurality of alternative streams of protected content (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 [chunks differ in encoding and bit rat : adaptive bitrate streaming system, para 0005]), where each of the streams of protected content is protected using cryptographic information (), the method comprising: requesting a file identifying a plurality of alternative streams of protected content using a playback device (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]), where each of the alternative streams of protected content are encrypted using cryptographic information (the chunks are protected using different watermark payloads, para 0052); obtaining the cryptographic information using 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); requesting portions of content from at least the plurality of alternative streams of protected content using the playback device (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]); accessing the protected content using the playback device and the cryptographic information (content ingested on server 301 part of a content distribution network, para 0052; server provides access to the client based on the selection or chunks requested, para 0053); and playing back the content using the playback device (playback of content on the client device, para 0053).Thorwirth lacks the teaching of a top level index file obtain the common cryptographic information. However, Thorwirth teaches a top level index file is well known in the art (top level index file pointing to a number of alternate streams that contain actual video and audio data, para 0009). 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).

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Regarding claim 103, Thorwirth discloses a machine readable medium containing processor instructions, where execution of the instructions by a processor causes the processor to perform a process (implementation process, para 0047 [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]) comprising: request a file identifying a plurality of alternative streams of protected 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]), where each of the alternative streams of protected content are encrypted using cryptographic information (the chunks are protected using different watermark payloads, para 0052); obtaining the cryptographic information (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058); requesting portions of content from at least the plurality of alternative streams of protected content (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]); accessing the protected content using the cryptographic information (content ingested on server 301 part of a content distribution network, para 0052; server provides access to the client based on the selection or chunks requested, para 0053); and playing back the content (playback of content on the client device, para 0053).Thorwirth lacks the teaching of a top level index file obtain the common cryptographic information. However, Thorwirth teaches a top level index file is well known in the art (top level index file pointing to a number of alternate streams that contain actual video and audio data, para 0009). 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).

Regarding claims 69 and 86, Thorwirth lacks the teaching wherein each of the alternative streams of protected content is contained within a separate container file; and the top level index file identifies a container file containing each of the alternative streams. 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).

Regarding claim 105, Thorwirth lacks the teaching wherein the machine readable medium is non-volatile memory. Amini teaches wherein the machine readable medium is non-volatile memory (memory 1104 with ROM [non-volatile], para 0068, 0069, see fig. 11). 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 non-volatile memory for storing 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 3, 16 lack an inventive step under PCT Article 33(3) as being obvious over Amini and in view of Schnell.

Regarding claims 3 and 16, Amini lacks the teaching wherein the encoding application configures the processor to obtain common cryptographic information by configuring the processor to: send a request to a DRM server for common cryptographic information; and receive the common cryptographic information from the DRM server. However, 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). Further, Schnell teaches a DRM system that sends cryptographic information to the media device (DRM system 118 with domain controller 124 and license server 126, where the DRM system encrypts the media content, licenser server can issue DRM licenses before media content by various media devices, para 0022, 0023 [media device 202 also includes DRM platform 21 to receive the DRM license, para 0034]).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).

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Claims 4-8, 17-21 lack an inventive step under PCT Article 33(3) as being obvious over Amini and in view of Thorwirth.

Regarding claims 4 and 17, Amini teaches the common cryptographic content and the plurality of alternative streams of protected content (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), but lacks the teaching wherein a title is associated with the common cryptographic content and the plurality of alternative streams of protected content. Thorwirth teaches a title is associated with the cryptographic content and the plurality of alternative streams of protected content (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]; the chunks are protected using different watermark payloads, para 0052). 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 title feature in the invention of Amini for the purpose of providing the content distribution server a link that includes a unique identifier that enables the server to determine the information to be embedded in the chunk (Thorwirth, para 0057).

Regarding claims 5 and 18, Amini lacks the teaching wherein the encoding application configures the processor to write each of the alternative streams of protected content to a separate container file. However, Thorwirth shows wherein the alternative streams of protected content are written into a container file is well known in the art (sections of multiple files are created with pointers within a container file, para 0004, 0010). 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 feature in the invention of Amini 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).

Regarding claims 6 and 19, 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), but lacks the teaching of the cryptographic information encrypted using at least one encryption key to each of the container files containing the alternative streams of protected content. Thorwirth teaches each stream of protected content includes a copy of the cryptographic information 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). 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 key in the invention of Amini for the purpose of providing an encryption key unique to a specific user or client device and the encrypted data is delivered securely and individually to the user and/or client device (Thorwirth, para 0058).

Regarding claims 7 and 20, Amini teaches wherein writing the 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), but lacks the teaching of writing to the container files containing the alternative streams of protected content comprises encrypting the at least a portion of the common cryptographic information written to each of the container files using at least one encryption key. Thorwirth teaches each stream of protected content includes a copy of the cryptographic information 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). 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 key in the invention of Amini for the purpose of providing an encryption key unique to a specific user or client device and the encrypted data is delivered securely and individually to the user and/or client device (Thorwirth, para 0058).

Regarding claims 8 and 21, Amini teaches wherein writing the 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), but lacks the teaching of writing to the container files containing the alternative streams of protected content comprises encrypting the at least a portion of the common cryptographic information written to each of the container files using the same encryption key. However, Thorwirth teaches each stream of protected content includes a copy of the cryptographic information 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). Further, encrypting the content for protection is well known in the art and the specifics (using same encryption key) 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 key in the invention of Amini for the purpose of providing an encryption key unique to a specific user or client device and the encrypted data is delivered securely and individually to the user and/or client device (Thorwirth, para 0058).

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Claims 9, 22 lack an inventive step under PCT Article 33(3) as being obvious over Amini and in view of Thorwirth and further in view of Soroushian et al., hereinafter referred to as Soroushian.

Regarding claims 9 and 22, Amini lacks the teaching wherein the container files are Matroska container files. Soroushian is in the field of playback and distribution systems (abstract) and further 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 Amini 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).

Claims 10-13, 23-26 lack an inventive step under PCT Article 33(3) as being obvious over Amini and in view of Thorwirth and further in view of Soroushian and even further in view of Schnell.

Regarding claims 10 and 23, Amini teaches 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) wherein, but lacks the teaching wherein the encoding application configures the processor to write a DRMHeader element to the TracksData element in a Tracks element within each of the Matroska container files, where the DRMHeader element includes an encrypted copy of the common cryptographic information. 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 Amini 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 Amini 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 11 and 24, Amini teaches 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) wherein, but lacks the teaching wherein the common cryptographic information is a set of encryption keys; the encoding application configures the processor to: encrypt the set of encryption keys using at least one encryption key; and write the encrypted set of encryption keys to the DRMHeader element of each of the Matroska container files. Thorwirth teaches 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). 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 key in the invention of Amini for the purpose of providing an encryption key unique to a specific user or client device and the encrypted data is delivered securely and individually to the user and/or client device (Thorwirth, para 0058). 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 Amini 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). Further, 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 Amini 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).

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Regarding claims 12 and 25, Amini teaches wherein: the source content includes a stream of video (bitstreams are series of compressed data units (video frames), para 0037); and the encoding application configures the processor to: encode a frame of video (encoding parameters generate several compressed data units of the original, para 0037); protect the encoded frame of video by encrypting at least a portion of the encoded frame of video (encryption is done, para 0041, encryptor 240 where the streams are encrypted, para 0032, see fig. 2; same key is used for different streams [common cryptographic information], para 0054). Amini lacks the teaching to write a BlockGroup element to a Matroska container file including a DRMinfo element identifying the at least one portion of the encoded frame of video that is encrypted and at least one encryption key from the set of encryption keys used to access the at least one encrypted portion of the encoded frame of video. 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 Amini 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 a DRMinfo element identifying the protected encoded element and using an encryption key from the set of encryption keys used to access the encrypted encoded content (file header object 218 [DRM header element] has the DRM licenses for the protected media content, para 0036; tracks objects 22 which has the track attributes and segment data to identify the content, 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 Schnell to incorporate the DRM elements in the invention of Amini 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 13 and 26, Amini lacks the teaching wherein the encoding application further configures the processor to: generate an index for each Matroska container file during the encoding of each of the streams of protected content; and write a Cues element containing the index to the indexed 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]). 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 Amini 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 Amini 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).

Claims 34, 35, 41-48, 54, 55, 59-66 lack an inventive step under PCT Article 33(3) as being obvious over Thorwirth and in view of Schnell and further in view of Amini and even further in view of Soroushian.

Regarding claim 34, 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 claim 35, 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).

Regarding claim 41, Thorwirth lacks the teaching wherein the container files are Matroska container files. Soroushian is in the field of playback and distribution systems (abstract) and further 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).

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Regarding claim 42, Thorwirth lacks the teaching wherein the source encoder is configured to write a DRMHeader element to a TracksData element in a Tracks element within each of the Matroska container files, where the DRMHeader element includes an encrypted copy of the common cryptographic information. 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).

Regarding claim 43, 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 of each of the Matroska container files. 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). 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). Further, 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 claim 44, Thorwirth wherein: the source content includes a stream of video (content ingested on server 301 part of a content distribution network, para 0052 [video]); and configured to: encode a frame from the stream 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); protect the encoded frame of video by encrypting at least a portion of the encoded frame of video (the chunks are protected using different watermark payloads, para 0052), but lacks the teaching wherein to write a BlockGroup element to a Matroska container file including a DRMinfo element identifying the at least one portion of the encoded frame of video that is encrypted and at least one encryption key from the set of encryption keys used to access the at least one encrypted portion of the encoded frame of video. 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 a DRMinfo element identifying the protected encoded element and using an encryption key from the set of encryption keys used to access the encrypted encoded content (file header object 218 [DRM header element] has the DRM licenses for the protected media content, para 0036; tracks objects 22 which has the track attributes and segment data to identify the content, 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 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).

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Regarding claim 45, Thorwirth lacks the teaching wherein the source encoder is configured to: generate an index for each Matroska container file during the encoding of each of the streams of protected content; and write a Cues element containing the index to the indexed 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]). 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).

Regarding claim 46, Thorwirth lacks the teaching wherein the container files are Matroska container files. Soroushian is in the field of playback and distribution systems (abstract) and further 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 claim 47, Thorwirth lacks the teaching wherein the source encoder is configured to write a DRMHeader element to a TracksData element in a Tracks element within each of the Matroska container files, where the DRMHeader element includes an encrypted copy of the common cryptographic information. 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).

Regarding claim 48, 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).

Regarding claim 54, 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).

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Regarding claim 55, 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).

Regarding claim 59, Thorwirth lacks the teaching wherein the container files are Matroska container files. Soroushian is in the field of playback and distribution systems (abstract) and further 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 claim 60, Thorwirth lacks the teaching wherein the source encoder is configured to write a DRMHeader element to a TracksData element in a Tracks element within each of the Matroska container files, where the DRMHeader element includes an encrypted copy of the common cryptographic information. 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).

Regarding claim 61, 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 of each of the Matroska container files. 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). 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). Further, 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).

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Regarding claim 62, Thorwirth wherein: the source content includes a stream of video (content ingested on server 301 part of a content distribution network, para 0052 [video]); and configured to: encode a frame from the stream 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); protect the encoded frame of video by encrypting at least a portion of the encoded frame of video (the chunks are protected using different watermark payloads, para 0052), but lacks the teaching wherein to write a BlockGroup element to a Matroska container file including a DRMinfo element identifying the at least one portion of the encoded frame of video that is encrypted and at least one encryption key from the set of encryption keys used to access the at least one encrypted portion of the encoded frame of video. 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 a DRMinfo element identifying the protected encoded element and using an encryption key from the set of encryption keys used to access the encrypted encoded content (file header object 218 [DRM header element] has the DRM licenses for the protected media content, para 0036; tracks objects 22 which has the track attributes and segment data to identify the content, 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 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 claim 63, Thorwirth lacks the teaching wherein the source encoder is configured to: generate an index for each Matroska container file during the encoding of each of the streams of protected content; and write a Cues element containing the index to the indexed 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]). 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).

Regarding claim 64, Thorwirth lacks the teaching wherein the container files are Matroska container files. Soroushian is in the field of playback and distribution systems (abstract) and further 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 claim 65, Thorwirth lacks the teaching wherein the source encoder is configured to write a DRMHeader element to a TracksData element in a Tracks element within each of the Matroska container files, where the DRMHeader element includes an encrypted copy of the common cryptographic information. 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).

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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).

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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).

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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 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).

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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).

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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).

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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 PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 02353AB.PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2011/067167	International filing date *(day/month/year)* 23 December 2011 (23.12.2011)	Priority date *(day/month/year)* 05 January 2011 (05.01.2011)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant DIVX, LLC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	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 Article 35(2) 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

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 25 February 2014 (25.02.2014)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Simin Baharlou e-mail: pt09.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DAVID 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)*	02 JUL 2012

Applicant's or agent's file reference	FOR FURTHER ACTION
02353AB.PCT	See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2011/067167	23 December 2011	05 January 2011

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06T 11/00 (2012.01)
USPC - 345/471

Applicant DIVX, LLC.

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.

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 June 2012	Blaine R. Copenheaver 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/US2011/067167

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:

Form PCT/ISA/237 (Box No. I) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/067167

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the appicable time limit:

   ☐ paid additional fees

   ☐ paid additional fees under protest and, where applicable, the protest fee

   ☐ paid additional fees under protest but the applicable protest fee was not paid

   ☒ not paid additional fees

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

   ☐ complied with

   ☒ not complied with for the following reasons:

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 fees must be paid.

Group I, claims 1-25, drawn to a method of playing back encoded media and a playback device, comprising requesting and buffering portions of video from at least one of alternative streams using a playback device; requesting information indicative of a font utilized by a font-rendering engine to render text from a selected subtitle stream; device; downloading at least one font file when the font is not present on the playback requesting and buffering at least a portion of the selected subtitle stream; decoding the buffered portions of video using a decoder on the playback device; rendering the portions of the subtitle stream corresponding to the buffered portion of video using a font-rendering engine configured by the at least one downloaded font file; and performing synchronized playback of the decoded video and rendered subtitles using the playback device.

Group II, claims 26-43, drawn to method of encoding source media and a source encoder, comprising: selecting a portion of the source media using a source encoder; transcoding the selected portion of the source media into a plurality of alternative portions of encoded video using the source encoder, where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame at the start of a closed group of pictures (GOP); writing each of the alternative portions of encoded video to a separate container file using the source encoder; writing a subtitle stream segment from each subtitle track corresponding to the selected portion of the source media to a separate container file using the source encoder; and associating a font file with at least one of the container files containing subtitle stream segments.

The inventions listed as Groups I-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 feature of the Group I invention: requesting and buffering portions of video from at least one of alternative streams using a playback device; requesting information indicative of a font utilized by a font-rendering engine to render text from a selected subtitle stream; device; downloading at least one font file when the font is not present on the playback requesting and buffering at least a portion of the selected subtitle stream; decoding the buffered portions of video using a decoder on the playback device; rendering the portions of the subtitle stream corresponding to the buffered portion of video using a font-rendering engine configured by the at least one downloaded font file; and performing synchronized playback of the decoded video and rendered subtitles using the playback device as claimed therein is not present in the invention of Group II. The special technical feature of the Group II invention: selecting a portion of the source media using a source encoder; transcoding the selected portion of the source media into a plurality of alternative portions of encoded video using the source encoder, where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame at the start of a closed group of pictures (GOP); writing each of the alternative portions of encoded video to a separate container file using the source encoder; writing a subtitle stream segment from each subtitle track corresponding to the selected portion of the source media to a separate container file using the source encoder; and associating a font file with at least one of the container files containing subtitle stream segments as claimed therein is not present in the invention of Groups I.

Groups I and II lack unity of invention because even though the inventions of these groups require the technical feature of encoding media including at least one subtitle track, where the media is encoded as a plurality of alternative video streams and at least one subtitle stream, using a source encoder, this technical feature is not a special technical feature as it does not make a contribution over the prior art in view of US 2009/0307258 A1 (PRIYARDARSHI et al) 10 December 2009 (10.12.2009) paragraphs [0021], [0048], [0067], [0069], claim 20.

Since none of the special technical features of the Group I or II inventions are found in more than one of the inventions, unity of invention is lacking.

4. Consequently, this opinion has been established in respect of the following parts of the international application:

   ☐ all parts

   ☒ the parts relating to claims Nos. 1-25

Form PCT/ISA/237 (Box No. IV) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/067167

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	1-25	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-25	NO
Industrial applicability (IA)	Claims	1-25	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-17 and 24-25 lack an inventive step under PCT Article 33(3) as being obvious over Priyadarshi et al. (US 2009/0303241 A1; hereinafter Priyadarshi) in view of Kohli et al. (WO 2010/060106 A1; hereinafter Kohli).

Regarding claim 1, Priyadarshi discloses a method of playing back encoded media (Fig. 1 and Paragraphs [0008], [0027] and [0030]; the invention is to a playback system that displays multimedia files with rendered font and text subtitles that match the video file. The multimedia presentation is analyzed by an encoder/decoder to determine the unique character for each movie/video), where the media is encoded as a stream and at least one subtitle stream (Fig. 6, Paragraphs [0027], [0030] and [0036]; the stream of data includes encoded movie stream data and subtitle information that corresponds to the movie data. With the subtitle information being several font files (31, 32, 33) that correspond to the over time stream of video data), the method comprising: requesting and buffering portions of video from at least one stream using a playback device (Fig. 4 and Paragraph [0031]; video textual elements are sent to a character buffer for playback processing); requesting information indicative of a font utilized by a font-rendering engine to render text from a selected subtitle stream (Fig. 6 and Paragraphs [0021], [0026]-[0027] and [0038]; font files are used by a rendering module (font-rendering engine) to render the text or characters displayed with the movie stream); downloading at least one font file when the font is not present on the playback device (Paragraphs [0020], [0035] and [0038]; the necessary font files can be downloaded as an attachment); requesting and buffering at least a portion of the selected subtitle stream (Fig. 4 and Paragraph [0031]; video textual elements are sent to a character buffer for playback processing); decoding the buffered portions of video using a decoder on the playback device (Paragraphs [0030]-[0031] and [0033]; the buffered portions can be sent to a decoder for decoding of the text, audio and video portions); rendering the portions of the subtitle stream corresponding to the buffered portion of video using a font-rendering engine configured by the at least one downloaded font file (Fig. 6 and Paragraphs [0021], [0026]-[0027] and [0038]; font files are used by a rendering module (font-rendering engine) to render the text or characters displayed with the movie stream); and performing synchronized playback of the decoded video and rendered subtitles using the playback device (Fig. 6 and Paragraph [0036]; using start and end time code values the font files (31, 32, 33) are associated (synchronized) with their corresponding decoded video presentation timeline segments). Priyadarshi does not disclose wherein the streams are a plurality of alternative streams. However in disclosing a system of streaming media content (Abstract), Kohli teaches wherein the streams are a plurality of alternative streams (Figs. 1 and 5 and Paragraphs [0027], [0030] and [0162]; multiple media flow directors (alternative streams) can be used to deliver and stream media content to a user device). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the streams are a plurality of alternative streams in the invention of Priyadarshi as taught by Kohli, so the multiple media flow directors can be used to efficiently deliver the media content to a user (Kohli; Paragraph [0162]).

Regarding claim 2, Priyadarshi discloses the method of claim 1, but Priyadarshi does not disclose measuring the current streaming conditions by measuring the time taken to receive requested portions of a stream from the time at which the portions were requested. Kohli teaches measuring the current streaming conditions by measuring the time taken to receive requested portions of a stream from the time at which the portions were requested (Paragraph [0160]; the system measures the delays from streaming to displaying the video and sets the buffer at a setting that covers for these delays). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include measuring the current streaming conditions by measuring the time taken to receive requested portions of a stream from the time at which the portions were requested in the invention of Priyadarshi as taught by Kohli, so the delays can be covered (Kohli; Paragraph [0160]).

Regarding claim 3, Priyadarshi discloses the method of claim 2, but Priyadarshi does not disclose wherein requesting and buffering portions of video from at least one of the alternative streams using a playback device further comprises requesting and buffering portions of video from at least one of the alternative streams based upon the bitrates of the alternative streams and the measured streaming conditions using a playback device. Kohli teaches wherein requesting and buffering portions of video from at least one of the alternative streams using a playback device further comprises requesting and buffering portions of video from at least one of the alternative streams based upon the bitrates of the alternative streams and the measured streaming conditions using a playback device (Paragraphs [0142], [0159]-[0160]; the requested stream can be video from a server at a particular bit rate that suits the clients needs. The requested streams are then buffered to overcome delays as previously disclosed). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein requesting and buffering portions of video from at least one of the alternative streams using a playback device further comprises requesting and buffering portions of video from at least one of the alternative streams based upon the bitrates of the alternative streams and the measured streaming conditions using a playback device in the invention of Priyadarshi as taught by Kohli, so the delays can be covered and a set bit rate file can be sent to the client (Kohli; Paragraphs [0159]-[0160]).

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

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Supplemental Box

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

Regarding claim 4, Priyadarshi discloses the method of claim 1, wherein the selected subtitle stream is stored within a container file that includes the font file as an attachment to the container file (Paragraphs [0021] and [0038]; the font files for the subtitles are electronic data files containing a set of representations for displaying characters or symbols where the containers can include an attachment link).

Regarding claim 5, Priyadarshi discloses the method of claim 4, wherein the container file in which the selected subtitle stream is stored includes a separate element containing metadata describing the attached font file (Paragraph [0038] and Claim 11; the font file can include metadata tags in the file such as the description, start time and end time for each attachment).

Regarding claim 6, Priyadarshi discloses the method of claim 5, further comprising determining whether the font file is present on the playback device without downloading the font file by requesting the metadata describing the attached font file from the container file using the playback device (Fig. 6 and Paragraph [0038]; using the description in each multimedia container the system can determine if an attachment font link is/file is necessary for each time period in a movie).

Regarding claim 7, Priyadarshi discloses the method of claim 5, wherein the metadata describing the attached font file includes a description of the font file and the location of the font file within the container file (Fig. 6 and Paragraph [0038]; using the description in each multimedia container the system can determine if an attachment font link is/file is necessary for each time period in a movie).

Regarding claim 8, Priyadarshi discloses the method of claim 1, but Priyadarshi does not disclose wherein the font file is compressed and the method further ~~comprises~~ decompressing the downloaded font file using the playback device. Kohli teaches wherein the font file is compressed and the method further comprises decompressing the downloaded font file using the playback device (Paragraph [0080]; the video information can include compressed and/uncompressed video data and video attributes (font files)). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the font file is compressed and the method further comprises decompressing the downloaded font file using the playback device in the invention of Priyadarshi as taught by Kohli, so space can be conserved (Kohli; Paragraphs [0080]).

Regarding claim 9, Priyadarshi discloses the method of claim 1, but Priyadarshi does not disclose wherein the selected subtitle stream is selected by the playback device in response to a user instruction. However turning on subtitles on a movie is a known practice in the art and would simply be a matter of inventor design choice. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the selected subtitle stream is selected by the playback device in response to a user instruction in the invention of Priyadarshi so users can see corresponding text to videos if necessary or desired.

Regarding claim 10, Priyadarshi discloses the method of claim 1, but Priyadarshi does not disclose displaying a user interface indicative of the estimated time to download the at least one font file using the playback device. However displaying download information such as estimated download time in a media related system is a known practice in the art and the specifics would simply be a matter of inventor design choice. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include displaying a user interface indicative of the estimated time to download the at least one font file using the playback device in the invention of Priyadarshi so users can see how long till their media file is done downloading and plan their time accordingly.

Regarding claim 11, Priyadarshi discloses the method of claim 1, wherein the subtitle stream is encoded as Unicode text (Paragraph [0005]; the fonts/subtitles can be encoded using Unicode encoding).

Regarding claim 12, Priyadarshi discloses the method of claim 1, wherein requesting and buffering at least a portion of the selected subtitle stream comprises downloading and buffering the entire subtitle stream prior to the commencement of playback (Paragraph [0031]; all textual elements (subtitles) can be extracted, buffered and then decoded for playback)

Regarding claim 13, Priyadarshi discloses the method of claim 1, wherein requesting and buffering at least a portion of the selected subtitle stream comprises requesting and buffering segments of the subtitle stream with timing corresponding to the timing of the portions of video requested by the playback device (Fig. 6 and Paragraphs [0033] and [0036]; the font file portions can be segmented to smaller sized segments that correspond to time segments within the overall movie timeline as shown in figure 6).

Regarding claim 14, Priyadarshi discloses the method of claim 13, wherein the font used to render the subtitle track is contained within a plurality of font files and at least one of the plurality of font files corresponds to a segment of the subtitle stream (Fig. 6 and Paragraphs [0033] and [0036]; the font file portions can be segmented to smaller sized segments that correspond to time segments within the overall movie timeline as shown in figure 6), the method further comprising downloading the font file corresponding to a segment of the subtitle stream when the playback device requests the segment of the subtitle stream (Paragraphs [0036] and [0038]; font files corresponding to a particular time can be attached/downloaded as necessary to display subtitles during that time period).

Regarding claim 15, Priyadarshi discloses the method of claim 14, wherein the font used to render the subtitle track is active according to an associated start timecode and end timecode, and the start and end timecodes are independent of the subtitle segment times (Paragraph [0038]; the fonts rendered for each time periods can be downloaded based on font attachment file start and end times).

Regarding claim 16, Priyadarshi discloses the method of claim 15, wherein start and end timecodes for a plurality of font segments overlap, and lead to multiple font segments being utilized for rendering subtitles at a given time (Paragraphs [0036] and [0038]; the video can have multiple font files which are associated with the overall timeline with all the files being attached to the movie based on a corresponding start and end time of the font attachment file).

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/067167

Supplemental Box

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

Regarding claim 17, Priyadarshi discloses the method of claim 1, wherein: the streams and the subtitle stream are stored in separate container files (Paragraphs [0036] and [0038]; the video can have multiple font container files which are associated with the overall timeline with all the files being attached to the movie based on a corresponding start and end time of the font attachment file). Priyadarshi does not disclose wherein requesting portions of a stream further comprising requesting portions of files from remote servers via Hypertext Transfer Protocol (HTTP) byte range requests using the playback device. Kohli teaches wherein requesting portions of a stream further comprising requesting portions of files from remote servers via Hypertext Transfer Protocol (HTTP) byte range requests using the playback device (Paragraphs [0114]-[0115]; the server can be a HTTP server and the client can request content by byte ranges). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein requesting portions of a stream further comprising requesting portions of files from remote servers via Hypertext Transfer Protocol (HTTP) byte range requests using the playback device in the invention of Priyadarshi as taught by Kohli, so the managing device can server the appropriate content to the user (Kohli; Paragraphs [0114]-[0115]).

Regarding claim 24, Priyadarshi discloses the method of claim 1, but Priyadarshi does not disclose retrieving a top level index file using the playback device that identifies the alternative streams and identifies at least one subtitle stream. Kohli teaches retrieving a top level index file using the playback device that identifies the alternative streams and identifies at least one subtitle stream (Paragraph [0041]; the video file format information (which include the subtitle information as previously disclosed) can be stored in a server side index table (top level index file) that can be used to quickly be used to find the associated frame for each new bit rate video stream). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include retrieving a top level index file using the playback device that identifies the alternative streams and identifies at least one subtitle stream in the invention of Priyadarshi as taught by Kohli, so the index can be used to quickly find the associated frame for each new bit rate video stream (Kohli; Paragraph [0041]).

Regarding claim 25, Priyadarshi discloses a playback device configured to playback encoded media (Fig. 1 and Paragraphs [0008], [0027] and [0030]; the invention is to a playback system that displays multimedia files with rendered font and text subtitles that match the video file. The multimedia presentation is analyzed by an encoder/decoder to determine the unique character for each movie/video), where the media is encoded as a stream and at least one subtitle stream (Fig. 6, Paragraphs [0027], [0030] and [0036]; the stream of data includes encoded movie stream data and subtitle information that corresponds to the movie data. With the subtitle information being several font files (31, 32, 33) that correspond to the over time stream of video data), the playback device comprising: a processor configured to request portions of files (Paragraph [0010]; the system includes a processor that is configured to extract/request text data from a multimedia file having audio and video data) wherein the processor is configured to: request and buffer portions of video from at least one of the streams (Fig. 4 and Paragraph [0031]; video textual elements are sent to a character buffer for playback processing); request information indicative of a font utilized by a font-rendering engine to render text from a selected subtitle stream (Fig. 6 and Paragraphs [0021], [0026]-[0027] and [0038]; font files are used by a rendering module (font-rendering engine) to render the text or characters displayed with the movie stream); download at least one font file when the font is not present on the playback device (Paragraphs [0020], [0035] and [0038]; the necessary font files can be downloaded as an attachment); request and buffer at least a portion of the selected subtitle stream (Fig. 4 and Paragraph [0031]; video textual elements are sent to a character buffer for playback processing); decode the buffered portions of video (Paragraphs [0030]-[0031] and [0033]; the buffered portions can be sent to a decoder for decoding of the text, audio and video portions); render the portions of the subtitle stream corresponding to the buffered portion of video using a font-rendering engine configured by the at least one downloaded font file (Fig. 6 and Paragraphs [0021], [0026]-[0027] and [0038]; font files are used by a rendering module (font-rendering engine) to render the text or characters displayed with the movie stream); and perform synchronized playback of the decoded video and rendered subtitles (Fig. 6 and Paragraph [0036]; using start and end time code values the font files (31, 32, 33 - subtitles) are associated (synchronized) with their corresponding decoded video presentation timeline segments). Priyadarshi does not disclose wherein the streams are a plurality of alternative streams; wherein the processor is configured by a client application; wherein the requested portions are from a remote server. However in disclosing a system of streaming media content (Abstract), Kohli teaches wherein the streams are a plurality of alternative streams (Figs. 1 and 5 and Paragraphs [0027], [0030] and [0162]; multiple media flow directors (alternative streams) can be used to deliver and stream media content to a user device); wherein the processor is configured by a client application (Paragraph [0166]; the system can have an input device that receives and sends client commands (client application) to the processor); wherein the requested portions are from a remote server (Paragraphs [0151] and [0173]; the requested code information can be received from a remote server (630)). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the streams are a plurality of alternative streams; wherein the processor is configured by a client application; wherein the requested portions are from a remote server in the invention of Priyadarshi as taught by Kohli, so the multiple media flow directors can be used to efficiently deliver the media content to a user (Kohli; Paragraph [0162]).

Claims 18-23 lack an inventive step under PCT Article 33(3) as being obvious over Priyadarshi et al. (US 2009/0303241 A1; hereinafter Priyadarshi) in view of Kohli et al. (WO 2010/060106 A1; hereinafter Kohli) in further view of Soroushian et al. (US 2009/0132599 A1; hereinafter Soroushian).

Regarding claim 18, Priyadarshi discloses the method of claim 1, but Priyadarshi does not disclose wherein the alternative streams and the subtitle stream are stored in separate Extensible Binary Markup Language (EBML) container files. However in disclosing a playback and distribution system (Abstract), Soroushian teaches wherein the alternative streams and the subtitle stream are stored in separate Extensible Binary Markup Language (EBML) container files (Fig. 9 and Paragraph [0042]; media files (which would include the subtitles) are stored in extensible Binary Meta Language (EBML) elements (containers)). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the alternative streams and the subtitle stream are stored in separate Extensible Binary Markup Language (EBML) container files in the invention of Priyadarshi as taught by Soroushian, so the media file can be easily indexed (Soroushian; Paragraph [0042]).

Form PCT/ISA/237 (Supplemental Box) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/067167

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
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Regarding claim 19, Priyadarshi discloses the method of claim 18, wherein each of the container files comprises a plurality of Cluster elements, where each Cluster element contains a portion of encoded media (Fig. 6 and Paragraphs [0033] and [0036]; the font file portions can be segmented to smaller sized segments (clusters) that correspond to time segments within the overall movie timeline as shown in figure 6). But Priyadarshi does not disclose wherein the container files are EBML container files. However in disclosing a playback and distribution system (Abstract), Soroushian teaches wherein the container files are EBML container files. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the container files are EBML container files in the invention of Priyadarshi as taught by Soroushian, so the media file can be easily indexed (Soroushian; Paragraph [0042]).

Regarding claim 20, Priyadarshi discloses the method of claim 19, wherein the portions of encoded media in each of the Cluster elements have the same duration (Paragraph [0037]; the font files can all be of an approximate equal size and duration).

Regarding claim 21, Priyadarshi discloses the method of claim 20, but Priyadarshi does not disclose wherein the portions of encoded media in each of the Cluster elements have a 2 second duration. However setting a segment to a particular duration is disclosed by Priyadarshi as disclosed in claim 20 and specifically setting the duration to 2 seconds would simply be a matter of inventor design choice. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the portions of encoded media in each of the Cluster elements have a 2 second duration in the invention of Priyadarshi, so the font files can all span an approximately equal amount of time within a movie (Priyadarshi; Paragraph [0037]).

Regarding claim 22, Priyadarshi discloses the method of claim 18, wherein the container file containing the selected subtitle stream includes at least one font file as an attachment to the container file (Paragraphs [0021] and [0038]; the font files for the subtitles are electronic data files containing a set of representations for displaying characters or symbols where the containers can include an attachment link). But Priyadarshi does not disclose wherein the container files are EBML container files. However in disclosing a playback and distribution system (Abstract), Soroushian teaches wherein the container files are EBML container files. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the container files are EBML container files in the invention of Priyadarshi as taught by Soroushian, so the media file can be easily indexed (Soroushian; Paragraph [0042]).

Regarding claim 23, Priyadarshi discloses the method of claim 22, but Priyadarshi does not disclose wherein the at least one font file attached to the container file are compressed. Kohli teaches wherein the at least one font file attached to the container file are compressed (Paragraph [0080]; the video information can include compressed and/uncompressed video data and video attributes (font files)). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the at least one font file attached to the container file are compressed in the invention of Priyadarshi as taught by Kohli, so space can be conserved (Kohli; Paragraphs [0080]).

Claims 1-25 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 PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 02549.PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2013/043181	International filing date *(day/month/year)* 29 May 2013 (29.05.2013)	Priority date *(day/month/year)* 28 June 2012 (28.06.2012)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant SONIC IP, Inc.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 11 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	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 Article 35(2) 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

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 31 December 2014 (31.12.2014)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Philippe Bécamel e-mail: pt03.pct@wipo.int

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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	06 DEC 2013

Applicant's or agent's file reference	FOR FURTHER ACTION
02549.PCT	See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2013/043181	29 May 2013	28 June 2012

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04N 5/783 (2013.01)
USPC - 386/343

Applicant DIVX, LLC

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.

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	27 November 2013	Blaine R. Copenheaver 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/US2013/043181

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:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

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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	1-20	YES
	Claims	None	NO
Inventive step (IS)	Claims	None.	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

See Supplemental Box

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/043181

Supplemental Box

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Claims 1, 2, 4, 6, 7, 11, 13, 14, 16, 19, 20, lack an inventive step under PCT Article 33(3) as being obvious over Cornelio et al., hereinafter referred to as Cornelio in view of Brusewitz et al., hereinafter referred to as Brusewitz.

Regarding claims 1, 19, 20, Cornelio discloses a method for fast startup of video playback of encoded media using at least two video streams, where the media is encoded as at least a first video stream and a second video stream, the method comprising [claims 1, 19] (a method which includes a video encoder 106 that dynamically adjusts the compression ratio, para 0028; by selecting the play button, a play request is sent and in response to the play request the video encoder 106 decodes the video stream and initiates the playing of the video at a current selected high quality image [startup of video playback], para 0082; the server 132 consists of video files 134 and 140, wherein the images of the video file 140 have a higher resolution higher quality than compared to video file 134, and when switching the input file at the client 110 the video transmitter 136 begins transmission from the video file 140 [second video stream] at a frame that corresponds to the last frame sent from video file 134 [first video stream], and the switching does cause a skip in the video as it is viewed at the client [interpreted as fast startup of video playback], para 0033, 0036, 0037), a network interface; memory; and a processor; wherein the processor is configured by a playback application to [claim 19] (a processor 122 executes sequences of instructions contained in the dynamic memory of client 110, to decode a video stream and transmit to the display 112 for playback, para 0022, 0023, 0025) a machine readable medium containing processor instructions, where execution of the instructions by a processor causes the processor to perform a process [claim 20] (a processor 122 executes sequences of instructions contained in the dynamic memory of client 110, to decode a video stream and transmit to the display 112 for playback, para 0022, 0023, 0025) comprising:
identifying a location within the first video stream at which to commence playback using a playback device (the user provides an input to switch between transmission rates of a video, upon which the video transmitter 136 begins transmission from the video file 140 at a frame that corresponds to the last frame sent [identifying a location] from video file 134 [first video stream], para 0036, 0037; a user selects a pause button to pause the playback of a video, and upon which the processor 122 transmits a message to the server 132, the message includes data that identifies a particular frame displayed in the video image 114, in response to message the video selector 130 locates a corresponding frame associated with the selected frame within the least compressed video file and sends it to the client as a snapshot [as the switch causes the playback from the identified frame corresponding to the location it is interpreted as location at which to commence playback], para 0039);
identifying a frame of video in the second video stream that corresponds with the identified location in the first video stream using the playback device (the server 132 stores data that indicates the correlation between the frames in video file 134 and the frames in video file 140, and when switching the video transmitter 136 begins transmission from the video file 140 at a frame [identifying a frame in the second video stream] that corresponds to the last frame sent from video file 134 [identified location in the first video stream], para 0036, 0037; the processor 122 transmits a message to the server 132, the message includes data that identifies a particular frame displayed in the video image 114, in response to message the video selector 130 locates a corresponding frame [corresponds with the identified location] associated with the selected frame [identifying a frame of video in the second video stream] within the least compressed video file and sends it to the client as a snapshot, para 0039);
requesting the identified frame of video in the second video stream using the playback device (when switching the video transmitter 136 begins transmission from the video file 140 [second video stream] at a frame that corresponds to the last frame sent from video file 134 [transmitting the identified frame of the video file 140 corresponding to the video file 134 is interpreted as requesting the identified frame], para 0036, 0037; the processor 122 transmits a message to the server 132, in response to message the video selector 130 locates a corresponding frame [interpreted as requesting the identified frame] associated with the selected frame within the least compressed video file and sends it to the client as a snapshot, para 0039);
decoding the identified frame of video in the second video stream using the playback device (the processor 122 transmits a message to the server 132, in response to message the video selector 130 locates a corresponding frame [interpreted as requesting the identified frame] associated with the selected frame within the least compressed video file and sends it to the client as a snapshot, para 0039; fig.2 shows the step 224 wherein less compressed data [second video stream] for the selected frame of video [identified frame] is transmitted from the server to the client, and at step 228 the less compressed data is decoded by the client device to display a high resolution image/snapshot at the client device, para 0048, 0049);
displaying the decoded frame of video in the second video stream while buffering video from the first video stream (a user continues viewing the video in real time [interpreted as while buffering video from the first video stream] while selected snapshot are being prepared and set to the users device, para 0055; fig.2 shows the step 224 wherein less compressed data [second video stream] for the selected frame of video [identified frame] is transmitted from the server to the client, and at step 228 the less compressed data is decoded by the client device to display a high resolution image/snapshot at the client device, para 0048, 0049), but lacks the teaching of requesting and buffering video from the first video stream starting at the identified location using the playback device; decoding video from the first video stream using the playback device; and displaying the decoded video from the first video stream when the first video stream is sufficiently buffered for continuous playback.

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Regarding claims 1, 19, 20 (Cont.)

However, Cornelio teaches requesting from the first video stream starting at an identified location using the playback device (in response to receiving an image request, an initial image location is identified within a video stream, the image provider 404 identifies the image location 810 within the video stream 800 as the initial image location, at step 708 the initial image is retrieved and at step 710 the image is sent to the client device, para 0097-0099); decoding video from the first video stream using the playback device (at step 712 upon receiving the image data at client device 110, the browser 402 decodes and displays the image data as video image 516 on the video display 112, para 0100); and displaying the decoded video from the first video stream (at step 712 upon receiving the image data at client device 110, the browser 402 decodes and displays the image data as video image 516 on the video display 112, para 0100). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Cornelio to incorporate requesting from the first video stream starting at the identified location using the playback device; decoding video from the first video stream using the playback device; and displaying the decoded video from the first video stream into the invention of Cornelio. The motivation would have been to send higher quality of images over a limited bandwidth (see Cornelio para 0011).
Brusewitz is in the field of display and transmission of high resolution images on a video system (abstract) and teaches buffering video from the video stream and displaying the video stream when the video stream is sufficiently buffered for continuous playback (the low resolution copy of the detailed image is transmitted via the transmission channel 20 and buffer 23 to decoder 24, which displays the low resolution image, col.5, lines 54-65; figs.4A-4D shows a low resolution video image produced and displayed immediately prior to the display of the high resolution image segments, in fig.4B only the top portion of the low quality image is replaced with a higher quality image [buffering video from the video stream] and further in the fig.4C upon the completion of the high resolution download of the image, the entire high resolution image is displayed [the displaying of the low resolution image by continuously/gradually improving the quality while the high resolution image is being downloaded is interpreted as displaying sufficiently buffered for continuous playback], col.7, lines 30-58). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Brusewitz to incorporate requesting and buffering video from the first video stream starting at the identified location and displaying the decoded video from the first video stream when the first video stream is sufficiently buffered for continuous playback into the invention of Cornelio. The motivation would have been to diminish the viewer's perception of delay (see Brusewitz col.7, lines 27-29).

Regarding claim 2, Cornelio further teaches wherein the first video stream is encoded at a first bitrate, the second video stream is encoded at a second bitrate, and the first bitrate is smaller than the second bitrate (the storage 144 contains multiple versions of a video file and contains a video file 134 that has been pre compressed at a compression ratio lower resolution [first bitrate] and lower quality, and a second video file 140 that has been pre-compressed using a different lower compression ratio which is of higher resolution [second bitrate] and higher quality than the images represented in video file 134, para 0033). However, to establish first bitrate is smaller or greater than the second bitrate would have been a matter of design choice and would have been a known practice in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings to incorporate the first bitrate is greater than the second bitrate into the invention of Cornelio. The motivation would have been to send higher quality of images over a limited bandwidth (see Cornelio para 0011).

Regarding claim 4, Cornelio further teaches wherein the first video stream is encoded at a first resolution, the second video stream is encoded at a second resolution, and the first resolution is smaller than the second resolution (the storage 144 contains multiple versions of a video file and contains a video file 134 that has been pre compressed at a compression ratio lower resolution [first resolution] and lower quality, and a second video file 140 that has been pre-compressed using a different lower compression ratio which is of higher resolution [second resolution] and higher quality than the images represented in video file 134, para 0033). However, to establish first resolution is smaller or greater than the second resolution would have been a matter of design choice and would have been a known practice in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings to incorporate the first resolution is greater than the second resolution into the invention of Cornelio. The motivation would have been to send higher quality of images over a limited bandwidth (see Cornelio para 0011).

Regarding claim 6, Cornelio further teaches wherein identifying a frame of video in the second video stream that corresponds with the identified location in the first video stream comprises determine a frame of video in the second stream that corresponds to the identified location within the first video stream at which to commence playback (the server 132 stores data that indicates the correlation between the frames in video file 134 and the frames in video file 140, and when switching the video transmitter 136 begins transmission from the video file 140 at a frame [identifying a frame in the second video stream] that corresponds to the last frame sent from video file 134 [identified location in the first video stream], para 0036, 0037), but lacks the teaching of comprises requesting an index of the second video stream and using the index to determine a frame of video in the second stream.
However, Cornelio teaches requesting an index of the video stream and using the index to determine a frame of video in the stream that corresponds to the identified location within the first video stream at which to commence playback (fig.8 shows a video stream 800 and includes image data 185-195 corresponding to image data locations 802-824, upon a request for a next image is received from a client 102 a direction indicator and the frame offset is utilized, when the next image is identified to have a frame offset of 3 and a direction indicator of "back", and upon the current image location corresponding to the image location 812 then the next image is identified to at location 806 with the image data 187). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Cornelio to incorporate requesting an index of the second video stream and using the index to determine a frame of video in the second stream into the invention of Cornelio. The motivation would have been to send higher quality of images over a limited bandwidth (see Cornelio para 0011).

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INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/043181

Supplemental Box

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Regarding claim 7, Cornelio further teaches wherein: the first video stream and the second video stream are stored in separate container files (the server 132 includes the storage 144 which stores video file 134 and video file 140 [separate container files], and contains multiple versions of a video file and contains a video file 134 that has been pre compressed at a compression ratio lower resolution and lower quality [first video stream], and a second video file 140 that has been pre-compressed using a different lower compression ratio which is of higher resolution [second video stream] and higher quality than the images represented in video file 134, para 0033, 0036), but lacks the teaching of and requesting and buffering video from the first video stream starting at the identified location using a playback device further comprises requesting portions of files from at least one remote server via Hypertext Transfer Protocol (HTTP) byte range requests using the playback device.
However, Cornelio teaches requesting from the first video stream starting at the identified location using the playback device further comprises requesting portions of files from at least one remote server via Hypertext Transfer Protocol (HTTP) byte range requests using the playback device (in response to receiving an image request, an initial image location is identified within a video stream, the image provider 404 identifies the image location 810 within the video stream 800 as the initial image location, at step 712 upon receiving the image data at client device 110, the browser 402 decodes and displays the image data as video image 516 on the video display 112, para 0097-0100; the web server 102 and the client 110 are connected through the internet, and the client 110 includes video display 12 and a video decoder 108 implemented on a HTTP client such as a browser, and is dynamically linked to web browser [the client requests files from the web server via the HTTP browser interpreted as remote server via Hypertext Transfer Protocol byte range requests], para 0020, 0021). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Cornelio to incorporate requesting from the first video stream starting at the identified location using a playback device further comprises requesting portions of files from at least one remote server via Hypertext Transfer Protocol (HTTP) byte range requests using the playback device into the invention of Cornelio. The motivation would have been to send higher quality of images over a limited bandwidth (see Cornelio para 0011).
Brusewitz is in the field of display and transmission of high resolution images on a video system (abstract) and teaches comprises buffering video from the video stream (figs.4A-4D shows a low resolution video image produced and displayed immediately prior to the display of the high resolution image segments, in fig.4B only the top portion of the low quality image is replaced with a higher quality image and further in the fig.4C upon the completion of the high resolution download of the image, the entire high resolution image is displayed [the displaying of the low resolution image by continuously/gradually improving the quality while the high resolution image is being downloaded is interpreted as buffering video from the video stream], col.7, lines 30-58). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Brusewitz to incorporate decoding the buffered video and displaying the decoded video into the invention of Cornelio. The motivation would have been to diminish the viewer's perception of delay (see Brusewitz col.7, lines 53-57).

Regarding claim 11, Cornelio further teaches comprising configuring the playback device to decode the identified frame of video in the second video stream based upon the encoding of the identified frame of video in the second video stream (the processor 122 transmits a message to the server 132, in response to message the video selector 130 locates a corresponding frame [interpreted as requesting the identified frame] associated with the selected frame within the least compressed video file and sends it to the client as a snapshot, para 0039; fig.2 shows the step 224 wherein less compressed data [second video stream] for the selected frame of video [identified frame] is transmitted from the server to the client, and at step 228 the less compressed data is decoded by the client device to display a high resolution image/snapshot at the client device [as the identified frame of the video file is decoded it is inherent that the video was encoded], para 0048, 0049).

Regarding claim 13, Cornelio further teaches comprising decoding the video from the first video stream and displaying the decoded video (the image provider 404 identifies the image location 810 within the video stream 800 as the initial image location, at step 708 the initial image is retrieved and at step 710 the image is sent to the client device at step 712 upon receiving the image data at client device 110, the browser 402 decodes and displays the image data as video image 516 on the video display 112, para 0100), but lacks the teaching of decoding the buffered video.
Brusewitz is in the field of display and transmission of high resolution images on a video system (abstract) and teaches comprises decoding the buffered video and displaying the decoded video (the low resolution copy of the detailed image is transmitted via the transmission channel 20 and buffer 23 to decoder 24, which displays the low resolution image, col.5, lines 54-65; figs.4A-4D shows a low resolution video image produced and displayed immediately prior to the display of the high resolution image segments, in fig.4B only the top portion of the low quality image is replaced with a higher quality image and further in the fig.4C upon the completion of the high resolution download of the image, the entire high resolution image is displayed [the displaying of the low resolution image by continuously/gradually improving the quality while the high resolution image is being downloaded is interpreted decoding the buffered video], col.7, lines 30-58). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Brusewitz to incorporate decoding the buffered video and displaying the decoded video into the invention of Cornelio. The motivation would have been to diminish the viewer's perception of delay (see Brusewitz col.7, lines 53-57).

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

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Supplemental Box

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

Regarding claim 14, Cornelio further teaches comprising configuring the playback device to decode content from the first video stream based upon the encoding of the first video stream (the image provider 404 identifies the image location 810 within the video stream 800 as the initial image location, at step 708 the initial image is retrieved and at step 710 the image is sent to the client device at step 712 upon receiving the image data at client device 110, the browser 402 decodes and displays the image data as video image 516 on the video display 112 [as the identified frame of the video file is decoded it is inherent that the video was encoded interpreted as based upon the encoding of the first video stream], para 0100).

Regarding claim 16, Cornelio further teaches displaying the decoded frame of video while buffering portions of video from the video stream further (a user continues viewing the video in real time [interpreted as while buffering video from the first video stream] while selected snapshot are being prepared and set to the users device, para 0055; fig.2 shows the step 224 wherein less compressed data [second video stream] for the selected frame of video [identified frame] is transmitted from the server to the client, and at step 228 the less compressed data is decoded by the client device to display a high resolution image/snapshot at the client device, para 0048, 0049), but lacks the teaching of displaying the decoded frame of video in the trick play stream comprises displaying the same decoded frame of video continuously until the portions of video from the video stream are adequately buffered for display
Brusewitz is in the field of display and transmission of high resolution images on a video system (abstract) and teaches comprises displaying the decoded frame of video continuously until the portions of video from the video stream are adequately buffered for display (the low resolution copy of the detailed image is transmitted via the transmission channel 20 and buffer 23 to decoder 24, which displays the low resolution image, col.5, lines 54-65; figs.4A-4D shows a low resolution video image produced and displayed immediately prior to the display of the high resolution image segments, in fig.4B only the top portion of the low quality image is replaced with a higher quality image and further in the fig.4C upon the completion of the high resolution download of the image, the entire high resolution image is displayed [the displaying of the low resolution image by continuously/gradually improving the quality while the high resolution image is being downloaded is interpreted as displaying the decoded frame of video continuously until video stream are adequately buffered], col.7, lines 30-58). Furthermore, to establish to display the same decoded frame continuously would have been a matter of design choice and would have been a known practice in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Brusewitz to incorporate displaying the decoded frame of video in the trick play stream while buffering portions of video from the video stream further comprises displaying the same decoded frame of video continuously until the portions of video from the video stream are adequately buffered for display into the invention of Cornelio. The motivation would have been to diminish the viewer's perception of delay (see Brusewitz col.7, lines 27-29).

Claims 3, 5, 10, 17, 18, lack an inventive step under PCT Article 33(3) as being obvious over Cornelio in view of Brusewitz and further in view of Baldwin et al., hereinafter referred to as Baldwin.

Regarding claim 3, Cornelio further teaches the second video stream (shown above in claim 1), but lacks the teaching of wherein the second video stream is a trick play stream and each frame of the second video stream is encoded as an intra frame.
Baldwin is in the field of a trick mode support for video on demand with long intra frame intervals (title, abstract) and teaches wherein the video stream is a trick play stream and wherein frames of the video stream are encoded as an intra frame (fig.3 shows a trick mode implementation with multiple streams 302a-302e encoded with staggered intra frame intervals [interpreted as trick play stream], each shaded area represents an encoded intra frame, the video stream 302a represents media content encoded with an intra-frame interval of 10 seconds, para 0021-0024). Furthermore, to establish that each frame of the second video stream is encoded as an intra frame would have been a matter of design choice and would have been a known practice in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Baldwin to incorporate wherein the second video stream is a trick play stream and each frame of the second video stream is encoded as an intra frame into the invention of Cornelio. The motivation would have been to provide staggered intra frames to provide quicker responses when the server receives request it selects the nearest future intra frame (see Baldwin para 0007).

Regarding claim 5, Cornelio further teaches the second video stream (shown above in claim 1), but lacks the teaching of wherein the second video stream is a trick play stream and each frame of the second video stream is encoded as an intra frame.
Baldwin is in the field of a trick mode support for video on demand with long intra frame intervals (title, abstract) and teaches wherein the video stream is a trick play stream and wherein frames of the video stream are encoded as an intra frame (fig.3 shows a trick mode implementation with multiple streams 302a-302e encoded with staggered intra frame intervals [interpreted as second video stream is a trick play stream], each shaded area represents an encoded intra frame, the video stream 302a, 302b represents media content encoded with an intra-frame interval of 10 seconds, para 0021-0024). Furthermore, to establish that each frame of the second video stream is encoded as an intra frame would have been a matter of design choice and would have been a known practice in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Baldwin to incorporate wherein the second video stream is a trick play stream and each frame of the second video stream is encoded as an intra frame into the invention of Cornelio. The motivation would have been to provide staggered intra frames to provide quicker responses when the server receives request it selects the nearest future intra frame (see Baldwin para 0007).

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

Regarding claim 10, Cornelio lacks the teaching of wherein the first video stream is selected from a plurality of alternative video streams. Baldwin is in the field of a trick mode support for video on demand with long intra frame intervals (title, abstract) and teaches wherein the first video stream is selected from a plurality of alternative video streams (a stream selector 112 controls selection of appropriate video streams based on client request, and selects one stream from a set of video streams, based on the user requests, if the user requests by selecting a play control function then the stream is selected from a set of normal rate forward playing video streams, and when the user selects a fast forward control function then a stream is selected from a set of fast forward streams [interpreted s alternative video streams], para 0016). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Baldwin to incorporate wherein the first video stream is selected from a plurality of alternative video streams into the invention of Cornelio. The motivation would have been to provide staggered intra frames to provide quicker responses when the server receives request it selects the nearest future intra frame (see Baldwin para 0007).

Regarding claim 17, Cornelio lacks the teaching of wherein the identified frame of video in the trick play stream is downloaded together with at least part of at least one subsequent frame in the stream.
Brusewitz is in the field of display and transmission of high resolution images on a video system (abstract) and teaches wherein the frame of video in the stream is downloaded together with at least part of at least one subsequent frame in the stream (figs.4A-4D shows a low resolution video image produced and displayed immediately prior to the display of the high resolution image segments, in fig.4B only the top portion of the low quality image is replaced with a higher quality image and further in the fig.4C upon the completion of the high resolution download of the image, the entire high resolution image is displayed [the displaying of the low resolution image by continuously/gradually improving the quality while the high resolution image is being downloaded is interpreted as frame of video in the stream is downloaded together with one subsequent frame in the stream], col.7, lines 30-58). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Brusewitz to incorporate wherein the identified frame of video in the trick play stream is downloaded together with at least part of at least one subsequent frame in the stream into the invention of Cornelio. The motivation would have been to diminish the viewer's perception of delay (see Brusewitz col.7, lines 27-29)
Baldwin is in the field of a trick mode support for video on demand with long intra frame intervals (title, abstract) and teaches wherein the identified frame of video stream is a trick play stream (fig.3 shows a trick mode implementation with multiple streams 302a-302e encoded with staggered intra frame intervals [interpreted as trick play stream], each shaded area represents an encoded intra frame, the video stream 302a represents media content encoded with an intra-frame interval of 10 seconds [identified frame], para 0021-0024). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Baldwin to incorporate the identified frame of video in the trick play stream into the invention of Cornelio. The motivation would have been to provide staggered intra frames to provide quicker responses when the server receives request it selects the nearest future intra frame (see Baldwin para 0007).

Regarding claim 18, Cornelio further teaches displaying the decoded frame of video while buffering portions of video from the video stream further (a user continues viewing the video in real time [interpreted as while buffering video from the first video stream] while selected snapshot are being prepared and set to the users device, para 0055; fig.2 shows the step 224 wherein less compressed data [second video stream] for the selected frame of video [identified frame] is transmitted from the server to the client, and at step 228 the less compressed data is decoded by the client device to display a high resolution image/snapshot at the client device, para 0048, 0049). but lacks the teaching of wherein displaying the decoded frame of video in the trick play stream further comprises displaying the same decoded frame of video continuously until the portions of video from the video stream are adequately buffered for display.
Brusewitz is in the field of display and transmission of high resolution images on a video system (abstract) and teaches comprises displaying the decoded frame of video continuously until the portions of video from the video stream are adequately buffered for display (the low resolution copy of the detailed image is transmitted via the transmission channel 20 and buffer 23 to decoder 24, which displays the low resolution image, col.5, lines 54-65; figs.4A-4D shows a low resolution video image produced and displayed immediately prior to the display of the high resolution image segments, in fig.4B only the top portion of the low quality image is replaced with a higher quality image and further in the fig.4C upon the completion of the high resolution download of the image, the entire high resolution image is displayed [the displaying of the low resolution image by continuously/gradually improving the quality while the high resolution image is being downloaded is interpreted as displaying the decoded frame of video continuously until video stream are adequately buffered], col.7, lines 30-58). Furthermore, to establish to display the same decoded frame continuously would have been a matter of design choice and would have been a known practice in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Brusewitz to incorporate displaying the decoded frame of video in the trick play stream while buffering portions of video from the video stream further comprises displaying the same decoded frame of video continuously until the portions of video from the video stream are adequately buffered for display into the invention of Cornelio. The motivation would have been to diminish the viewer's perception of delay (see Brusewitz col.7, lines 27-29).

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

Claim 8 lacks an inventive step under PCT Article 33(3) as being obvious over Cornelio in view of Brusewitz and further in view of Soroushian et al., hereinafter referred to as Soroushian.

Regarding claim 8, Cornelio lacks the teaching of wherein the first video stream and the second video stream are stored in separate Extensible Binary Markup Language (EBML) container files.
Soroushian is in the field of to provide critical information or playback data included in a multimedia content to be decoded and presented (abstract) and teaches wherein the first video stream and the second video stream are stored in separate Extensible Binary Markup Language (EBML) container files (fig.4 shows a multimedia file 40 which includes Extensible Binary Markup Language (EBML) element 41 and further includes the tracks section 45 information which includes video data, playback data, para 0023). 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 wherein the first video stream and the second video stream are stored in separate Extensible Binary Markup Language (EBML) container files into the invention of Cornelio. The motivation would have been optimize the process of decoding and presenting partially available multimedia content including critical information (see Soroushian para 0007).

Claims 9, 12, 15, lack an inventive step under PCT Article 33(3) as being obvious over Cornelio in view of Brusewitz and further in view of Thorwirth.

Regarding claim 9, Cornelio further teaches comprising retrieving a file using the playback device that identifies the first video stream and the second video stream (a user selects a pause button to pause the playback of a video, and upon which the processor 122 transmits a message to the server 132, the message includes data [retrieving a file] that identifies a particular frame displayed in the video image 114, in response to message the video selector 130 locates a corresponding frame associated with the selected frame [that identifies first video stream and the second video stream] within the least compressed video file and sends it to the client as a snapshot, para 0039; the user provides an input to switch between transmission rates of a video, upon which the video transmitter 136 begins transmission from the video file 140 [second video stream] at a frame that corresponds to the last frame sent from video file 134 [first video stream], para 0036, 0037), but lacks the teaching of comprising retrieving a top level index file using the playback device.
Thorwirth is in the field of enhance the security of playlists composed for a client device with encoding information in the playlists (abstract) and teaches retrieving a top level index file using the playback device (the playlist encodes information using a sequence of links that refer to chunks, and each chunk differs in watermark information, the content retrieved [retrieving the encoding information] using a playlist exhibits an individual sequence of watermarked chunks that are encoded information [determine the encoding], para 0046; an index within a container file allows fast access to individual sections/chunks, and the chunks are retrieved by a client via the playlist and each is encoded at a different bitrate by the adaptive bitrate streaming system, the SMIL top level index file and the indexes within each of the container files provide a complete index to all of the alternative chunks for different sections of a piece of content, para 0009). 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 retrieving a top level index file using the playback device into the invention of Cornelio. The motivation would have been to provide enhanced security of content distribution using individualized playlists (see para 0018).

Regarding claim 12, Cornelio further teaches wherein configuring the playback device to decode the identified frame of video in the second video stream based upon the encoding of the identified frame of video in the second video stream (the processor 122 transmits a message to the server 132, in response to message the video selector 130 locates a corresponding frame [interpreted as requesting the identified frame] associated with the selected frame within the least compressed video file and sends it to the client as a snapshot, para 0039; fig.2 shows the step 224 wherein less compressed data [second video stream] for the selected frame of video [identified frame] is transmitted from the server to the client, and at step 228 the less compressed data is decoded by the client device to display a high resolution image/snapshot at the client device [as the identified frame of the video file is decoded it is inherent that the video was encoded interpreted as based upon the encoding of the second video stream], para 0048, 0049), but lacks the teaching of comprises using a top level index to locate encoding information for the second video stream and retrieving the encoding information to determine the encoding of the second video stream.
Thorwirth is in the field of enhance the security of playlists composed for a client device with encoding information in the playlists (abstract) and teaches using a top level index to locate encoding information for the video stream (in an adaptive streaming system the source media is often organized on a media server by using a top level index file pointing to a number of alternate streams that contain actual video and audio data, further the source media is encoded at multiple bit rates and the client device switches between streaming the different encodings depending on the available resources, para 0009) and retrieving the encoding information to determine the encoding of the video stream (the playlist encodes information using a sequence of links that refer to chunks, and each chunk differs in watermark information, the content retrieved [retrieving the encoding information] using a playlist exhibits an individual sequence of watermarked chunks that are encoded information [determine the encoding], para 0046; an index within a container file allows fast access to individual sections/chunks, and the chunks are retrieved by a client via the playlist and each is encoded at a different bitrate by the adaptive bitrate streaming system, the SMIL top level index file and the indexes within each of the container files provide a complete index to all of the alternative chunks for different sections of a piece of content, para 0009). 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 using a top level index to locate encoding information for the video stream and retrieving the encoding information to determine the encoding of the video stream into the invention of Cornelio. The motivation would have been to provide enhanced security of content distribution using individualized playlists (see para 0018).

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

Regarding claim 15, Cornelio further teaches wherein configuring the playback device to decode content from the first video stream based upon the encoding of the first video stream (the image provider 404 identifies the image location 810 within the video stream 800 as the initial image location, at step 708 the initial image is retrieved and at step 710 the image is sent to the client device at step 712 upon receiving the image data at client device 110, the browser 402 decodes and displays the image data as video image 516 on the video display 112 [as the identified frame of the video file is decoded it is inherent that the video was encoded interpreted as based upon the encoding of the first video stream], para 0100), but lacks the teaching of comprises using a top level index to locate encoding information for the first video stream and retrieving the encoding information to determine the encoding of the first video stream.
Thorwirth is in the field of enhance the security of playlists composed for a client device with encoding information in the playlists (abstract) and teaches using a top level index to locate encoding information for the video stream (in an adaptive streaming system the source media is often organized on a media server by using a top level index file pointing to a number of alternate streams that contain actual video and audio data, further the source media is encoded at multiple bit rates and the client device switches between streaming the different encodings depending on the available resources, para 0009) and retrieving the encoding information to determine the encoding of the video stream (the playlist encodes information using a sequence of links that refer to chunks, and each chunk differs in watermark information, the content retrieved [retrieving the encoding information] using a playlist exhibits an individual sequence of watermarked chunks that are encoded information [determine the encoding], para 0046; an index within a container file allows fast access to individual sections/chunks, and the chunks are retrieved by a client via the playlist and each is encoded at a different bitrate by the adaptive bitrate streaming system, the SMIL top level index file and the indexes within each of the container files provide a complete index to all of the alternative chunks for different sections of a piece of content, para 0009). 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 using a top level index to locate encoding information for the video stream and retrieving the encoding information to determine the encoding of the video stream into the invention of Cornelio. The motivation would have been to provide enhanced security of content distribution using individualized playlists (see para 0018).

Claims 1-20 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 PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 03351AB.PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2014/039852	International filing date *(day/month/year)* 28 May 2014 (28.05.2014)	Priority date *(day/month/year)* 30 May 2013 (30.05.2013)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant SONIC IP, INC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	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 Article 35(2) 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

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 01 December 2015 (01.12.2015)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Yukari Nakamura e-mail: pt07.pct@wipo.int

Form PCT/IB/373 (January 2004)

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

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	05 DEC 2014
Applicant's or agent's file reference 03351AB.PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US14/39852	28 May 2014 (28.05.2014)	30 May 2013 (30.05.2013)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04N 21/2387 (2014.01)
CPC - G06F 3/04817

Applicant SONIC IP, 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.

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	21 October 2014 (21.10.2014)	Shane Thomas 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/US14/39852

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:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/39852

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:

   ☐ paid additional fees.

   ☐ paid additional fees under protest and, where applicable, the protest fee.

   ☐ paid additional fees under protest but the applicable protest fee was not paid.

   ☒ not paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

   ☐ complied with.

   ☒ not complied with for the following reasons:

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.

4. Consequently, this opinion has been established in respect of the following parts of the international application:

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-18

Form PCT/ISA/237 (Box No. IV) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/39852

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	2, 6, 8, 12, 14 and 18	YES
	Claims	1, 3-5, 7, 9-11, 13 and 15-17	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-18	NO
Industrial applicability (IA)	Claims	1-18	YES
	Claims	NONE	NO

2. Citations and explanations:

Claims 1, 3-5, 7, 9-11, 13 and 15-17 lacks novelty under PCT Article 33(2) as being anticipated by US 2012/0170642 A1 to Braness, J et al. (hereinafter "Braness").

As per claim 1, Braness discloses a method of supporting video streaming with trick play, comprising: encoding video into multiple adaptive bitrate streams and a corresponding trick play stream (a method is provided for visual search of media encoded for adaptive bitrate streaming using trick play streams, paragraph [0008]), each of the streams comprising files of encoded video (the EBML file may contain the trick play stream in which visual search of media encoded is with trick play stream, paragraphs [0008], [0023]); storing the files for each stream (Files generated by a source encoder may be stored on an HTTP server for streaming to playback devices, paragraph [0050]); receiving a playlist request for a selected one of the adaptive bitrate streams (the top level index SMIL file (playlist) can be generated when a playback device requests the commencement of playback of the encoded media in which media encoded may be for adaptive bitrate streaming, paragraphs [0008], [0070]); sending a playlist identifying the stored files of the selected stream (each of the alternative portions of encoded video may be written (sending) to a separate container file in which the playback device can use the top level index file to identify the URI for a more appropriate alternative stream (selected stream) paragraphs [0027], [0101]); receiving a playlist request for the trick play stream (the index may enable the playback device to use multiple byte range requests to select portions of the file containing the trick play stream which may be through HTTP server, paragraph [0044]) and sending a playlist identifying the stored files of the trick play stream (the playback device may use the SMIL file (playlist) to identify the portions of the container file (stored files) to download in which the container file contains the trick play stream, paragraphs [0027], [0070]).

As per claim 7, Braness discloses a system for supporting video streaming with trick play, comprising: an encoder to encode video into multiple adaptive bitrate streams and a corresponding trick play stream (a method is provided for visual search of media encoded for adaptive bitrate streaming using trick play streams, paragraph [0008]), each of the streams comprising files of encoded video (the EBML file may contain the trick play stream in which visual search of media encoded is with trick play stream, paragraphs [0008], [0023]); a download server to store the files for each stream (Files generated by a source encoder may be stored on an HTTP server for streaming to playback devices, paragraph [0050]); and a management server to: receive a playlist request for a selected one of the adaptive bitrate streams (the top level index SMIL file (playlist) can be generated when a playback device requests the commencement of playback of the encoded media in which media encoded may be for adaptive bitrate streaming in which a playback device may request the top level index file resident on the server (management server), paragraphs [0008], [0070], [0095]); send a playlist identifying the stored files of the selected stream (each of the alternative portions of encoded video may be written (sending) to a separate container file in which the playback device can use the top level index file to identify the URI for a more appropriate alternative stream (selected stream) paragraphs [0027], [0101]); receive a playlist request for the trick play stream (the index may enable the playback device to use multiple byte range requests to select portions of the file containing the trick play stream which may be through HTTP server, paragraph [0044]); and send a playlist identifying the stored files of the trick play stream (the playback device may use the SMIL file (playlist) to identify the portions of the container file (stored files) to download in which the container file contains the trick play stream, paragraphs [0027], [0070]).

As per claim 13, Braness discloses a non-transitory computer readable medium encoded with a computer program including instructions to cause a processor (processor is provided that is configured by a source encoder application stored in the memory, paragraph [0027]) to: encode video into multiple adaptive bitrate streams (media encoded may be for adaptive bitrate streaming, paragraph [0008]) and a corresponding trick play stream, each of the streams comprising files of encoded video (the index information may enable the playback device to request byte ranges that may correspond to Cluster elements within the Matroska container file that may contain specific portions of encoded media through HTTP from the server, paragraph [0044]); store the files for each stream (Files generated by a source encoder may be stored on an HTTP server for streaming to playback devices, paragraph [0050]); receive a playlist request for a selected one of the adaptive bitrate streams (the top level index SMIL file (playlist) can be generated when a playback device requests the commencement of playback of the encoded media in which media encoded may be for adaptive bitrate streaming, paragraphs [0008], [0070]); send a playlist identifying the stored files of the selected stream (each of the alternative portions of encoded video may be written (sending) to a separate container file in which the playback device can use the top level index file to identify the URI for a more appropriate alternative stream (selected stream) paragraphs [0027], [0101]); receive a playlist request for the trick play stream (the index may enable the playback device to use multiple byte range requests to select portions of the file containing the trick play stream which may be through HTTP server, paragraph [0044]); and send a playlist identifying the stored files of the trick play stream (the playback device may use the SMIL file (playlist) to identify the portions of the container file (stored files) to download in which the container file contains the trick play stream, paragraphs [0027], [0070]).

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/39852

Supplemental Box

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

-***-Continued from Box V: Citations and Explanations-***-
As per claims 3, 9 and 15, Braness discloses the method of claim 1, the system of claim 7 and the computer readable medium of claim 13. Braness further discloses wherein: the files in each stream are associated with successive time codes (the frames of the trick play stream are stored within Cluster elements having time codes corresponding to the Cluster elements of the alternative stream (successive time codes), paragraph [0042]); the playlist request for the selected stream specifies a current time code; and the playlist for the selected stream identifies files in the selected stream that are associated with successive time codes greater than the current time code (a Cluster element has a timecode associated with it, and each subsequent Block element specifies the timecode relative to the Cluster timecode, and the playback request will specify a target Cluster using a CueTime, paragraphs [0075] and [0082]).

As per claims 4, 10 and 16, Braness discloses the method of claim 3, the system of claim 9 and the computer readable medium of claim 15. Braness further discloses wherein: the playlist request for the trick play stream (a playback device requests the top level index file resident on the server and uses the index information to identify the streams that are available to the playback device in which Playback of trick play streams, [0095]) includes a trick play time code that is greater than the current time code; and the trick play playlist identifies files in the trick play stream associated with successively decreasing time codes that are each less than the trick play time code (playback requests indicate a CueTime to start, and a user may reverse direction through a trick play file having timecodes corresponding to the regular play file, paragraphs [0042], [0046], [0074], and [0082]).

As per claim 5, Braness discloses the method of claim 1. Braness further discloses wherein: the encoding includes encoding the video based on a distinct combination of an encoding bitrate and a video frame rate for each stream (the portion of video is encoded in each stream as a single closed group of pictures starting with an IDR frame in which streams that encode the same media content may be in different ways and/or at different bitrates (distinct combination) to enable adaptive bitrate streaming, paragraphs [0042], [0046]); and the encoding bit rate and video frame rate for the trick play stream are less than the encoding bitrates and video frame rates, respectively, for the adaptive bitrate streams (the trick play stream video may be encoded at a lower bitrate, frame rate and a lower resolution that may be with respect to the source video, writing each of the alternative portions of encoded video to a separate container file in which source media may be encoded as a number of alternative streams for adaptive bitrate streaming, paragraphs [0008], [0041], [0042]).

As per claim 11, Braness discloses the system of claim 7. Braness further discloses wherein: the encoder is further configured to encode the video based on a distinct combination of an encoding bitrate and a video frame rate for each stream (the portion of video is encoded in each stream as a single closed group of pictures starting with an IDR frame in which streams that encode the same media content may be in different ways and/or at different bitrates (distinct combination) to enable adaptive bitrate streaming, paragraphs [0042], [0046]); and the encoding bit rate and video frame rate for the trick play stream are less than the encoding bitrates and video frame rates, respectively, for the adaptive bitrate streams (the trick play stream video may be encoded at a lower bitrate, frame rate and a lower resolution that may be with respect to the source video, writing each of the alternative portions of encoded video to a separate container file in which source media may be encoded as a number of alternative streams for adaptive bitrate streaming, paragraphs [0008], [0041], [0042]).

As per claim 17, Braness discloses the computer readable medium of claim 13. Braness further discloses wherein: the instruction to cause the processor to encode include instructions to cause the processor (processor is configured by a source encoder application stored in the memory in which a user instruction is provided to perform a visual search using the trick play stream, paragraphs [0027], [0074]) to encode the video based on a distinct combination of an encoding bitrate and a video frame rate for each stream (the portion of video is encoded in each stream as a single closed group of pictures starting with an IDR frame in which streams that encode the same media content may be in different ways and/or at different bitrates (distinct combination) to enable adaptive bitrate streaming, paragraphs [0042], [0046]); and the encoding bit rate and video frame rate for the trick play stream are less than the encoding bitrates and video frame rates, respectively, for the adaptive bitrate streams (the trick play stream video may be encoded at a lower bitrate, frame rate and a lower resolution that may be with respect to the source video, writing each of the alternative portions of encoded video to a separate container file in which source media may be encoded as a number of alternative streams for adaptive bitrate streaming, paragraphs [0008], [0041], [0042]).

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/39852

Supplemental Box

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

-***-Continued from Previous Supplemental Box-***-
Claims 2, 8 and 14 lack an inventive step under PCT Article 33(3) as being obvious over Braness in view of US 2013/0019273 A1 to Ma, K et al. (hereinafter "Ma").

As per claims 2, 8 and 14, Braness discloses the method of claim 1, the system of claim 7 and the computer readable medium of claim 13. Braness further discloses wherein: the encoded video in the files corresponding to the adaptive bitrate streams comprises encoded video frames (media encoded may be for adaptive bitrate streaming in which encoded video may be written each of alternative portions to a separate container file that uses the source encoder, paragraph [0008]); and the encoded video in the files for the trick play stream (encoded video may be written each of alternative portions to a separate container file that uses the source encoder in which trick play stream may be written to a separate container file, paragraph [0008]). However, Braness fail to disclose including non-key frames each encoded based on video from one or more previous video frames, and key frames interspersed among the non-key frames, each of the key frames encoded independent of previous video frames; comprises key frames without non-key frames. Ma discloses including non-key frames each encoded based on video from one or more previous video frames (fast forward uses bursts of consecutive frames (both key frames and non-key frames) in which the first (D*F/ R) frames of each segment are played out, where F is the frame rate of the encoded video and in which all key frames within the previously parsed segment should be used before proceeding to step 412 that may be to retrieve and parse a new segment, paragraphs [0007], [0031]), and key frames interspersed among the non-key frames, each of the key frames encoded independent of previous video frames; comprises key frames without non-key frames (fast forward uses bursts of consecutive frames (both key frames and non-key frames) (interspersed) in which once the trick play bitrate is selected, processing proceeds to step 214 in which the next segment (independent of previous video frames) is downloaded such that it adheres to the selected trick play bitrate in which the segment is parsed to extract the key frames (without non-key frames) and processing proceeds to step 216, paragraph [0025]). It would have been a matter of obvious experimentation to one of ordinary skill in the art at the time of the invention to modify Braness's invention to include including non-key frames each encoded based on video from one or more previous video frames, and key frames interspersed among the non-key frames, each of the key frames encoded independent of previous video frames; comprises key frames without non-key frames, as taught by Ma, for the benefit of providing a method that includes faster data rate for normal playout using key and non-key frames.

Claims 6, 12 and 18 lack an inventive step under PCT Article 33(3) as being obvious over Braness in view of US 2012/0311094 A1 to Biderman, D et al.(hereinafter " Biderman").

As per claim 6, Braness discloses the method of claim 1. However, Braness fails to disclose wherein: the storing includes storing the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein; and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein. Biderman discloses wherein: the storing includes storing the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein (Multiple media files may be stored on the server in which media files may be retrieved using the URIs (corresponding list of network addresses) for those files in the play list in which Indexer 440 may create files with a listing of an order for identifiers corresponding to each file created by segmenter 430, paragraphs [0052], [0139], [0144]); and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein (a server provides the play list file 1001 that may contain the two different sets of URLs (identifying stored files) that may allow either 1 x playback or fast forward or reverse playback (trick play) in which a play list file may include Uniform Resource Identifiers (URIs) (list of network addresses) that may direct the client to the segmented media files stored on a server, paragraphs [0047], [0167]). It would have been a matter of obvious experimentation to one of ordinary skill in the art at the time of the invention to modify Braness's invention, to include wherein: the storing includes storing the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein; and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein, as taught by Biderman, for the benefit of providing single large file to store media content that can be used by the client for retrieving portion of contents based on the URIs.

As per claim 12, Braness discloses the system of claim 7. However, Braness fails to disclose wherein: the download server is configured to store the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein; and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein. Biderman discloses wherein: the download server is configured to store the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein (Multiple media files may be stored on the server (download server) in which the URIs may identify a location from which a client can download a supplementary media file and in which media files may be retrieved using the URIs (corresponding list of network addresses) for those files in the play list in which Indexer 440 may create files with a listing of an order for identifiers corresponding to each file created by segmenter 430, paragraphs [0052], [0139], [0144]); and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein (a server provides the play list file 1001 that may contain the two different sets of URLs (identifying stored files) that may allow either 1 x playback or fast forward or reverse playback (trick play) in which a play list file may include Uniform Resource Identifiers (URIs) (list of network addresses) that may direct the client to the segmented media files stored on a server, paragraphs [0047], [0167]). It would have been a matter of obvious experimentation to one of ordinary skill in the art at the time of the invention to modify Braness's invention to include wherein: the download server is configured to store the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein; and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein, as taught by Biderman, for the benefit of providing single large file to store media content that can be used by the client for retrieving portion of contents based on the URIs.

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/39852

Supplemental Box

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

-***-Continued from Previous Supplemental Box-***-

As per claim 18, Braness discloses the computer readable medium of claim 13. However, Braness fails to disclose wherein: the instruction to cause the processor to store include instructions to cause the processor to store the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein; and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein. Biderman discloses wherein: the instruction to cause the processor to store include instructions to cause the processor (processor is configured by a source encoder application stored in the memory in which a user instruction is provided to perform a visual search using the trick play stream, paragraphs [0027], [0074]) to store the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein (Multiple media files may be stored on the server (download server) in which the URIs may identify a location from which a client can download a supplementary media file and in which media files may be retrieved using the URIs (corresponding list of network addresses) for those files in the play list in which Indexer 440 may create files with a listing of an order for identifiers corresponding to each file created by segmenter 430, paragraphs [0052], [0139], [0144]); and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein (a server provides the play list file 1001 that may contain the two different sets of URLs (identifying stored files) that may allow either 1 x playback or fast forward or reverse playback (trick play) in which a play list file may include Uniform Resource Identifiers (URIs) (list of network addresses) that may direct the client to the segmented media files stored on a server, paragraphs [0047], [0167]). It would have been a matter of obvious experimentation to one of ordinary skill in the art at the time of the invention to modify Braness's invention to include wherein: the instruction to cause the processor to store include instructions to cause the processor to store the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein; and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein, as taught by Biderman, for the benefit of providing single large file to store media content that can be used by the client for retrieving portion of contents based on the URIs.

Claim 1-18 have industrial applicability as defined by PCT Article 33(4) because the subject matter 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 59264P/D579	**FOR FURTHER ACTION** see Form PCT/ISA/220 as well as, where applicable, item 5 below	
International application No. PCT/US07/63950	International filing date (*day/month/year*) 14 March 2007 (14.03.2007)	(Earliest) Priority Date (*day/month/year*) 14 March 2006 (14.03.2006)
Applicant DIVX, INC.		

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 3 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(b), 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 0208
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/63950

Box IV TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

NEW ABSTRACT

Federated systems for issuing playback certifications granting access to technically protected content are described. One embodiment of the system includes a registration server 26 connected to a network 14, a content server 12 connected to the network 14 and to a trusted system 24, a first device including a non-volatile memory that is connected to thenetwork and a second device inlcuding a non-volatile memory that is connected to the network 12. In addition, the registration server 26 is configured to provide the first device with a first set of activation information in a first format, the first device is configured to store the first set of activation information in non-volatile memory, the registration server 26 is configured to provide the second device is configured to store the second set of activation information in non-volatile memory.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0209
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US07/63950

A. CLASSIFICATION OF SUBJECT MATTER
IPC: **H04L 9/00**(2006.01)

USPC: 380/200,201;713/156;705/57,59
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)
U.S. : 380/200,201;713/156;705/57,59

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2005/0071209 (IRWIN et al.) 31 March 2005 (31.03.05), Entire Document.	1-29
Y	US 2006/0036549 (WU) 16 March 2006 (16.02.2006), Entire Document, especially [0092].	1-29

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* 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 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 February 2008 (19.02.2008)	19 MAR 2008
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 /Tongoc Tran/ Telephone No. (571)272-3843

Form PCT/ISA/210 (second sheet) (April 2007)

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)

	Date of mailing *(day/month/year)* 19 MAR 2008
Applicant's or agent's file reference 59264P/D579	**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:

- [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.

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:

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0212
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

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0213
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

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0214
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.

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 0215
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 0216
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference D1.01221.PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 08/87999	International filing date *(day/month/year)* 22 December 2008 (22.12.2008)	(Earliest) Priority Date *(day/month/year)* 02 January 2008 (02.01.2008)
Applicant DIVX, INC.		

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(b), 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.

Form PCT/ISA/210 (first sheet) (April 2007)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 08/87999

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H04N 7/12 (2009.01)
USPC - 348/390.1
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 - 348/390.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 348/384.1; 725/87 (see search terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWest(PGPB,USPT,EPAB,JPAB), Google Scholar, USPTO
(Search Terms: video, media, compression, encoding,resolution, frame rate, sub sample, enhancement, key frame)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ----- Y	US 2007/0234391 A1 (Hunter et al.) 04 October 2007 (04.10.2007) entire document especially para [0012], para [0153-0154], para [0152], para [0164] and [0178], para [0058], para [0059], para [0091]	1-3, 7, 9-12, 16-21 ---------- 4-6, 8, 13-15, 22, and 23
Y	US 2002/0136298 A1 (Anantharamu et al.) 26 September 2002 (26.09.2002) entire document especially para [0019], para [0030], para [0022], para [0035]	4-6, 8, 13-15, 22, and 23

☐ 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
07 February 2009 (07.02.2009)	19 MAR 2009
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) (April 2007)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
DAVID J. BAILEY
KAUTH, POMEROY, PECK & BAILEY LLP
P.O. BOX 19152
IRVINE, CA 92623

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	19 MAR 2009
Applicant's or agent's file reference D1:01221.PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 08/87999	22 December 2008 (22.12.2008)	02 January 2008 (02.01.2008)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04N 7/12 (2009.01)
USPC - 348/390.1

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	07 February 2009 (07.02.2009)	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 08/87999

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 08/87999

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

1. Statement

Novelty (N)	Claims	4-6, 8, 12-15, 19, 22, and 23	YES
	Claims	1-3, 7, 9-11, 16-18, 20, and 21	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-23	NO
Industrial applicability (IA)	Claims	1-23	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-3, 7, 9-11, 16-18, 20, and 21 lack novelty under PCT Article 33(2) as being anticipated by US 2007/0234391 A1 to Hunter et al. (hereinafter 'Hunter').

As per claim 1, Hunter discloses a method of encoding a media file for playing back, comprising: extracting a video track from an original media file, where content is encoded in the video track (para [0012]); using the encoded content to encode an application enhancement track, where encoding the application enhancement track includes discarding at least some of the content (para [0153-0154]); and creating a media file including the content from the original media file encoded in a video track and an accompanying application enhancement track (para [0154]).

As per claim 2, Hunter further discloses information is discarded from the content by sub-sampling the content (para [0153]).

As per claim 3, Hunter further discloses sub-sampling the content further comprises reducing a resolution scale of the content by a particular factor to generate the application enhancement track (para [0152]).

As per claim 7, Hunter further discloses the application enhancement track contains only video (para [0154]).

As per claim 9, Hunter further discloses creating a media file including the content from the original media file and the accompanying application enhancement track further comprises: re-encoding the content to maximize compression regardless of a size or frequency of time periods between key frames to create a compressed video track possessing the same resolution and frame rate as the video track (para [0012] Note: desired resolution); and creating a media file including the compressed video track and the accompanying application enhancement track (para [054]); wherein the media file including the compressed video track and the application enhancement track is smaller than the original media file (para [0152]).

As per claim 10, Hunter further discloses the content is compressed content (para [0154]).

As per claim 11, Hunter further discloses a method of decoding a media file for playing back, comprising: obtaining a media file containing compressed content and an accompanying application enhancement track which is a subset of the compressed content (para [0153] - [0154]); playing back the compressed content (para [0154]); and decoding frames of the application enhancement track at a rate proportional to a visual- search speed and from a location determined by the portion of the compressed content most recently played back (para [0154] and [0178]).

As per claim 16, Hunter further discloses the application enhancement track is part of the media file and is the compressed content at a reduced frame rate and at a reduced resolution (para [0152]).

As per claim 17, Hunter further discloses a system for playback of a media file, comprising: a media server configured to generate at least one application enhancement track from an original media file, the at least one application enhancement track having at least one frame in common with the original media file and being substantially smaller in file size than the original media file (para [0152]); and a client processor in network communication with the media server and configured to send requests for the original media file to the media server, the media server configured to transmit the requested original media file along with the at least one application enhancement track (para [0154]).

As per claim 18, Hunter further discloses the client processor further comprises a playback engine configured to decode the application enhancement track and to determine portions of the application enhancement track required to comply with user playback instructions (para [0154]).

As per claim 20, A media player comprising: a user interface configured to receive user instructions (para [0058]); and a playback engine configured to decode a media file containing content and an accompanying application enhancement track, which is a subset of the content (para [0153]); wherein the playback engine is configured to commence playback of the content in response to a user instruction received via the user interface (para [0059]); wherein the playback engine is configured to select portions of the application enhancement track to decode and playback in response to receipt of a user instruction received via the user interface and the portion of the content most recently played back by the playback engine (para [0091]).

---- Please see continuation sheet ----

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 08/87999

Supplemental Box

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

Continuation of:
Box No. V.2. Citations and explanations:

As per claim 21, Hunter further discloses the playback engine is configured to commence playback of the content in response to receipt of a user instruction received via the user interface and from a location determined based upon the portion of the application enhancement track most recently played back by the playback engine (para [0154] and [0178]).

Claims 12, and 19 lack an inventive step under PCT Article 33(3) as being obvious over Hunter.

As per claim 12, Hunter does not specifically disclose the application enhancement track includes only key-frames. However Hunter does disclose an enhancement track that contains only a library of video patterns (para [0154]). It would have been obvious to one of ordinary skill in the art to combine the key frames with the video patterns taught by Hunter as a matter of routine design since this would include more key data for the enhancement track.

As per claim 19, Hunter does not specifically disclose the application enhancement track contains only key frames. However Hunter does disclose an enhancement track that contains only a library of video patterns (para [0154]). It would have been obvious to one of ordinary skill in the art to combine the key frames with the video patterns taught by Hunter as a matter of routine design since this would include more key data for the enhancement track.

Claims 4-6, 8, 13-15, 22, and 23 lack an inventive step under PCT Article 33(3) as being obvious over Hunter in view of US 2002/0136298 A1 to Anantharamu et al. (hereinafter 'Anantharamu').

As per claim 4, Hunter does not disclose sub-sampling the content further comprises reducing a frame rate of the content by a particular factor to generate the application enhancement track. However in an analogous art Anantharamu discloses sub-sampling the content further comprises reducing a frame rate of the content by a particular factor to generate the application enhancement track (para [0019]). It would have been obvious to one of ordinary skill in the art to combine the video encoding method of Hunter with the frame rate manipulation taught by Anantharamu since this would further compress the data of the video being encoded.

As per claim 5, Hunter further discloses creating the media file further comprises embedding portions of the accompanying application enhancement track throughout the video track encoding the content (para [0154]).

As per claim 6, Hunter further discloses creating the media file further comprises incorporating the accompanying application enhancement track as a block within the media file (para [0154]).

As per claim 8, Anantharamu further discloses the application enhancement track contains key frames spaced at specific time intervals between each key-frame (para [0030]).

As per claim 13, Hunter does not specifically disclose further comprising at least one delta frame placed within a constant time difference to adjacent frames. However in an analogous art Anantharamu does disclose further comprising at least one delta frame placed within a constant time difference to adjacent frames (para [0022]). It would have been obvious to one of ordinary skill in the art to combine the video encoding method of Hunter with the frame rate manipulation taught by Anantharamu since this would further compress the data of the video being encoded.

As per claim 14, Anantharamu further discloses only key-frames are decoded when a predetermined visual-search speed is exceeded (para [0035]).

As per claim 15, Anantharamu further discloses a select number of key-frames are skipped along with any associated delta frames when a predetermined visual-search speed is exceeded (para [0035]).

As per claim 22, Hunter does not disclose the application enhancement track is part of the media file and is a sequence of key frames time stamped with the time stamps of the corresponding frames of the content. However in an analogous art Anantharamu does disclose the application enhancement track is part of the media file and is a sequence of key frames time stamped with the time stamps of the corresponding frames of the content (para [0022] Note: Table). It would have been obvious to one of ordinary skill in the art to combine the video encoding method of Hunter with the frame rate manipulation taught by Anantharamu since this would further compress the data of the video being encoded.

As per claim 23, Hunter further discloses the key frames are lower resolution relative to a resolution of the corresponding frames of the content (para [00153]).

Claims 1-23 have industrial application as defined by PCT Article 33(4), because the subject matter 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 D1:01393.PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 09/46588	International filing date *(day/month/year)* 08 June 2009 (08.06.2009)	(Earliest) Priority Date *(day/month/year)* 06 June 2008 (06.06.2008)
Applicant DIVX, INC.		

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(b), 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.

Form PCT/ISA/210 (first sheet) (April 2007)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 09/46588

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06T 11/00 (2009.01)
USPC - 345/471
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: 345/471

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 345/467, 471, 948, 551; 715/230-232, 248, 249

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWEST(USPT,PGPB,EPAB,JPAB); Google scholar Search terms: multimedia, audio, video, font near2 file, custom same font, textual information, general$ near2 font near2 file, custom near2 font near2 file, text$ information, optimiz$ near2 font, optimiz$ near2 text$, original font, original text, general$ near2 font near2 file

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2006/0168639 A1 (GAN et al.) 27 July 2006 (27.07.2006) entire document especially abstract; Fig. 2; para [0002]-[0003], [0005]-[0006], [0014]-[0019], [0021].	1-10, 25-27 --- 11-24
Y	US 2008/0120330 A1 (REED et al.) 22 May 2008 (22.05.2008) entire document especially para [0137]-[0139], [0262]-[0263].	11-24
A	US 2008/0120342 A1 (REED et al.) 22 May 2008 (22.05.2008) entire document	1-27

☐ 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
13 July 2009 (13.07.2009)	23 JUL 2009
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) (April 2007)

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)--

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0227
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

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 receive 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)--

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 [0262]).

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)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/41667

A. CLASSIFICATION OF SUBJECT MATTER
IPC: **G06F 15/00**(2006.01)

USPC: 715/500.1,716,723
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)
U.S. : 715/500.1,716,723

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
ACM, Google

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	LONG et al., Silver: Simplifying Video Editing with Metadata, ACM 2003, pages 1-2.	1-168
X --- Y	JUAN CASARES et al., Simplifying Video Editing Using Metadat, all.	165, 168 --- 166-167, 169
X	US 2002/0161462 A (FAY et al.) 31 October 2002 (31.10.2002), figures 6-7, [0103]-[0107], [0130]-[0132].	1-26
X	US 2003/0123855 A (OKADA et al.) 03 July 2003 (03.07.2003), [0020], [0039], [0244], [0860], [0616], [0687], [0533].	27-53
X --- Y	US 2003/0005442 A (BRODERSEN et al.) 02 January 2003 (01.02.2003), [0058], [0061], [0066].	54-96 --- 165-169

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* 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 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
24 May 2007 (24.05.2007)	20 JUN 2007
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 Cong-Lac Huynh Telephone No. 571-272-4125

Form PCT/ISA/210 (second sheet) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/41667

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. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, 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.

3. ☐ 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.

4. Additional comments:

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0231
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/41667

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 97-164	YES
	Claims 1-96,165-169	NO
Inventive step (IS)	Claims 97-164	YES
	Claims 1-96,165-169	NO
Industrial applicability (IA)	Claims 1-169	YES
	Claims NONE	NO

2. Citations and explanations:

Please See Continuation Sheet

Form PCT/ISA/237 (Box No. V) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/41667

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claim 167 is objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or contents thereof:
There are two claims 167. Therefore, the second claim 167 is misnumbered, which is a typographical error, and considered claim 169.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0233
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.

V. 2. Citations and Explanations:
Claims 1-26 lack novelty under PCT Article 33(2) as being anticipated by Fay et al. (US 2002/0161462, 10/31/02).

Regarding claims 1-26, Fay discloses a multimedia file comprising a plurality of encoded video tracks with RIFF chunks ([0113], [0114], [0117]), figures 6-8) where the video track has at least one audio track associated with it ([0119]) and audio chunk contains audio information from the portion of audio track accompanying the frame generated using a video chunk ([0119]. [0117],

Claims 27-53 lack novelty under PCT Article 33(2) as being anticipated by Okada et al. (US 2003/0123855, 7/3/03).

Regarding claims 27-53, Okada discloses a multimedia file comprising a series of encoded video frames (abstract, [0020], [0239]), encoded audio interleaved between the encoded video frames (abstract, [0020], [0239], [0244], [0860]) wherein the encoded audio includes two or more tracks of audio information [0244], [0616], [0687]) and wherein the multimedia file includes information for identifying audio tracks contained in the file ([0533]).

Claims 54-96 lack novelty under PCT Article 33(2) as being anticipated by Brodersen et al. (US 2003/0005442, 1/2/03).

Regarding claims 54-96, Brodersen discloses that the multimedia file comprising a series of encoded video frames ([0058], [[0061], [0066]), and at least one encoded subtitle track interleaved between the encoded video frames ([0058], [[0061], [0066]). Brodersen also discloses at least one encoded subtitle track comrprises a plurality of encoded subtitle tracks with information identifying the subtitle tracks ([0058], [0061], [0066]).

Claims 165-169 lack an inventive step under PCT Article 33(3) as being obvious over Casares et al., Simplifying Video Editing Using

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0234
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/41667

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

Metadata, ACM 2002, pages 157-166 in view of Brodersen et al. (US 2003/0005442, 1/2/03).

Regarding claims 165-169, Casares discloses a multimedia file comprising at least one encoded video tracks, at least one encoded audio tracks, a plurality of encoded text strings wherein the encoded text strings describe characteristics of at least one video track and at least one audio track (pages 157-158, Introduction). The multimedia also includes frames of different level described by text strings (pages 157-158, Introduction).
Casares does not disclose the subtitle track.
Brodersen discloses the subtitle track of the video frames ([0058], [0061], [0066]).
It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have combined Brodersen into Casares for further including subtitle tracks to video frames which are multimedia data related to video frames for having more details of the video frames.

Claims 97-119 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a multimedia file with encoded video frames with encoded menu information where the menu information is stored as a chunk.

Claims 120-164 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a multimedia file with encoded video frames and encoded metadata about the multimedia file where the meta data includes at least one statement comprising a subject, a predicate, and object and an authority where the subject contains information identifying a file, item, person or organization, predicate contains information indicative of a characteristic of the subject, the object contains information descriptive of the characteristic of the subject identified by the predicate, and the authority contains information of the source of the statement.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0235
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 53684P/D579	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US05/25845	International filing date (*day/month/year*) 21 July 2005 (21.07.2005)	(Earliest) Priority Date (*day/month/year*) 21 July 2004 (21.07.2004)
Applicant DIVXNETWORKS, INC.		

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 3 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. ☐ 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(b), 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. 4
      ☒ 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 0236
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/25845

Box IV TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

A media player (105) manages and controls rights to playback of media content (403) by the media player, which stores, during a registration (401) process in which the media player need not be connected to an external computing system, information (402) used by the media player to control playback. A minimal amount of the media player's memory is used to store the information used to control playback.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0237
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/25845

A. CLASSIFICATION OF SUBJECT MATTER
IPC: G06F 12/14(2006.01);G06F 17/30(2006.01);H04L 9/00(2006.01)
H04N 7/16(2006.01)

USPC: 705/59;726/26
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)
U.S. : 705/59; 726/26

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,509,070 (SCHULL) 16 April 1996 (16.04.1996), column 8, line 31 to column 9, line 53; column 10, lines 26-58; column 14 line 56 to column 15, line 35).	1-24

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* 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 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
05 February 2007 (05.02.2007)

Date of mailing of the international search report
10 MAY 2007

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
Matthew Heneghan
DEBORAH A. THOMAS
PARALEGAL SPECIALIST

Telephone No. (571)272-2100

Form PCT/ISA/210 (second sheet) (April 2005)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
WESLEY W. MONROE
CHRISTIE, PARKER & HALE, LLP
P.O. BOX 7068
PASADENA, CA 91109-7068

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	10 MAY 2007
Applicant's or agent's file reference 53684P/D579	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US05/25845	21 July 2005 (21.07.2005)	21 July 2004 (21.07.2004)

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

IPC: **G06F 12/14**(2006.01);**G06F 17/30**(2006.01);**H04L 9/00**(2006.01) H04N 7/16(2006.01)
USPC: 705/59;726/26

Applicant

DIVXNETWORKS, 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	05 February 2007 (05.02.2007)	Matthew Heneghan DEBORAH A. THOMAS PARALEGAL SPECIALIST Telephone No. (571)272-2100

Form PCT/ISA/237 (cover sheet) (April 2005)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/25845

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. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, 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.

3. ☐ 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.

4. Additional comments:

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0240
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/25845

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 1-24	NO
Inventive step (IS)	Claims NONE	YES
	Claims 1-24	NO
Industrial applicability (IA)	Claims 1-24	YES
	Claims NONE	NO

2. Citations and explanations:

Claims 1-24 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. The invention may be in the area of protected copyrighted media from unauthorized usage.

Claims 1-24 lack novelty under PCT Article 33(2) as being anticipated by US 5509070 (SCHULL).
As per claims 1-5 and 17, Schull discloses a distribution system wherein registration information including a guard (a password) is provided for producing configuration information; received back is the password, keys, and key ID for key lookup and a check against the password for key retrieval (see column 8, line 31 to column 9, line 53; column 10, lines 26-58).
As per claim 6-16 and18-24, Schull discloses a key lookup according to the ID for media retrieval (see column 14, line 56 to column 15, line 35).

Claims 1-24 lack an inventive step under PCT Article 33(3) as being obvious over US 5509070 (SCHULL) for the reasons stated regarding the lack of novelty.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0241
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/25845

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Form PCT/ISA/237 (Box No. VII) (April 2005)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/25845

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the questions whether the claims are fully supported by the description, are made:

In the preamble of claim 1, "randomly-generated" should read as "randomly generating"

Form PCT/ISA/237 (Box No. VIII) (April 2005)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

RECEIVED
IN JAN 26 2009
By

Applicant's or agent's file reference D1.01187.PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 08/83816	International filing date *(day/month/year)* 17 November 2008 (17.11.2008)	(Earliest) Priority Date *(day/month/year)* 16 November 2007 (16.11.2007)
Applicant DIVX, INC.		

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(b), 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.

Form PCT/ISA/210 (first sheet) (April 2007)

CASE # D1.01187PCT ACTION _____
REMINDER _____ DUE DATE _____
DEADLINE _____

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 08/83818

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 15/16 (2009.01)
USPC - 709/203
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 - 709/203

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 709/201-202; 380/200,255

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
USPTO WEST (PGPB, USPT, EPAB, JPAB); GOOGLE
multimedia, content, cue data, index, reduced index, hierarchical index, hierarchical, play, trick play, playback

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2006/0235880 A1 (Qian) 19 October 2006 (19.10.2006), entire document, especially: Figs. 3, 4, 9; para [0017], [0019], [0020]-[0022], [0024], [0027], [0029], [0032], [0037], [0042], [0044]-[0046], [0051], [0053], [0054]	1-23

☐ 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
10 January 2009 (10.01.2009)	22 JAN 2009
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) (April 2007)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
KAUTH, POMEROY, PECK & BAILEY LLP
P.O. BOX 19152
IRVINE, CA 92623

PCT

JAN 2 8

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	22 JAN 2009
Applicant's or agent's file reference D1:01167.PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 08/83816	17 November 2008 (17.11.2008)	16 November 2007 (16.11.2007)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 15/16 (2009.01)
USPC - 709/203

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	10 January 2009 (10.01.2009)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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

CASE # D1:01167.PCT ACTION _____
REMINDER _____ DUE DATE _____
DEADLINE _____

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 06/63816

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:

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0247
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 08/83816

Box No. V **Reasoned statement under Rule 43bis.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	1-23	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-23	NO
Industrial applicability (IA)	Claims	1-23	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-23 lack novelty under PCT Article 33(2) as being anticipated by US 2006/0235880 A1 to Qian.

As per claim 1, Qian teaches a method of playing back content by a playback device stored in a media file, the method comprising: providing a media file to a playback device (para [0019]), the media file having content data (para [0020]), cue data (para [0020]) and a hierarchical index (para [0017], [0022]), the content data having a plurality of media frames (para [0020]), the cue data being associated with each frame of the plurality of frames and the hierarchical index being associated with a subset of the cue data (timestamp / offset , para [0037]); decoding the content data by a playback device (para [0019]); displaying content on a display screen from the decoded content data (para [0053]); receiving a user request (para [0053]); locating the index based on the user request (para [0044]); and decoding one or more media frames from the subset of the cue data based on the located index (para [0044]).

As per claim 2, Qian teaches the method of claim 1 wherein the index has reference values that point directly to particular media frames of the plurality of media frames (para [0037]).

As per claim 3, Qian teaches the method of claim 1 wherein the hierarchical index includes pointers to the cue data within the media file and further comprising accessing the cue data through the pointers to locate a frame to be decoded (para [0021], [0024]).

As per claim 4, Qian teaches the method of claim 1 wherein the hierarchical index is associated with a subset of the plurality of media frames through a second hierarchical index and further comprising locating a subset of the second hierarchical index based on the hierarchical index relative to the user request (Fig. 4, para [0032]).

As per claim 5, Qian teaches the method of claim 4 wherein decoding one or more media frames from the subset of the plurality of media frames is based on the located subset of the second hierarchical index (Fig. 4, para [0032]).

As per claim 6, Qian teaches the method of claim 1 wherein the media file has an upper hierarchical index associated with the hierarchical index and the hierarchical index associated with one or more media frames from the subset of the plurality of media frames and wherein the upper hierarchical index has a greater number of associations with one or more media frames than the hierarchical index (para [0029], [0032], [0042]).

As per claim 7, Qian teaches a method of encoding a media file for playing back by a playback device, comprising: incorporating seek locations with content data (para [0037]), the content data having audio, video and subtitle tracks, the seek locations identifying particular timestamps for particular frames within the audio, video or subtitle tracks; incorporating an index referencing the incorporated seek locations (para [0037]); and creating a media file having the content data, the incorporated seek locations, and the incorporated index (Fig. 3, para [0027]).

As per claim 8, Qian teaches the method of claim 7 wherein incorporating the index further comprises interleaving an index between audio and video tracks (para [0024]).

As per claim 9, Qian teaches the method of claim 8 wherein the index points only to key frames within the audio, video or subtitle tracks (para [0037]).

As per claim 10, Qian teaches the method of claim 9 wherein the index contains locations and timestamps to key frames (para [0037]).

As per claim 11, Qian teaches a system for playback of a media file, comprising: a media server configured to transmit a media file having at least one index having pointers that reference at least one frame of media content within the media file (para [0046]); and a client processor in network communication with the media server and configured to send requests for the media file to the media server (Fig. 9, para [0054]), the media server configured to transmit the media file requested (para [0046]), the client processor comprises a playback engine configured to locate a pointer from the at least one index to locate and decode the portions of the media file based on the located pointer to comply with user playback instructions (Fig. 9, para [0054]).

(See Supplemental Box)

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

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 08/82818

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
Claim 23 refers to Claim 19, but also mentions a "located cluster." Only claim 22 mentions the element of locating a cluster, so it appears that Claim 23 should instead refer to Claim 22.

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

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 08/83818

Supplemental Box

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

Continuation of:
V. 2. Citations and Explanations

As per claim 12, Qian teaches the system of claim 11 wherein the at least one index contains pointers to key frames only (para [0037]).

As per claim 13, Qian teaches the system of claim 11 wherein the at least one index contains pointers to another index that contains pointers that reference at least one frame of media content within the media file (para [0021], [0024]).

As per claim 14, Qian teaches the system of claim 11 wherein the at least one index comprises a plurality of pointers, each pointer referencing a frame of media content and the plurality of pointers in its entirety referencing each frame of media content (para [0037]).

As per claim 15, Qian teaches the system of claim 11 wherein the at least one index comprises a coarse index having pointers referencing frames of media content and a fine index having pointers referencing frame of the media content, the fine index having more pointers than the coarse index (para [0033]).

As per claim 16, Qian teaches the system of claim 11 wherein the at least one index comprises a reduced index having pointers only to access frames of the media content (para [0043]).

As per claim 17, Qian teaches a method of decoding a multimedia file having an index included with the multimedia file, the method comprising: locating an index within a multimedia file (para [0019]), the index having a plurality of index data-points and the multimedia file having a plurality of frames (para [0020]) and a plurality of cue data-points having a time stamp (para [0037]) and a location of a specific frame of the plurality of frames (para [0037]); loading the located index into storage (para [0051]); locating an index data-point from the plurality of index data-points based on a timestamp (para [0044], [0045]); and locating a cue data-point from the plurality of cue-data points based on the located index data-point (para [0019]).

As per claim 18, Qian teaches the method of claim 17 further comprising displaying a video frame on a display screen, the displayed video frame being a frame that corresponds to a frame referenced in the located cue data-point (Fig. 9, para [0046], [0053]).

As per claim 19, Qian teaches the method of claim 18 further comprising playing audio through a speaker system in a synchronized manner relative to the displayed frame and the played audio being based on audio information that corresponds to a beginning of audio data for the displayed frame (para [0017], [0019], [0020]).

As per claim 20, Qian teaches the method of claim 18 further comprising displaying subtitles in a synchronized manner relative to the displayed frame and the displayed subtitles being based on subtitle information that corresponds to subtitle data for the displayed frame (para [0019]).

As per claim 21, Qian teaches the method of claim 18 further comprising displaying metadata information relative to the displayed frame and the displayed metadata information being based on metadata information that corresponds to metadata for the displayed frame (para [0029], [0032], [0044]).

As per claim 22, Qian teaches the method of claim 17 further comprising locating a cluster referenced by the located cue data-point ("cluster", localized TOC indexes, para [0021]).

As per claim 23, Qian teaches the method of claim 19 further comprising locating a block within the located cluster and referenced by the located cue data-point (para [0021]).

Claims 1-23 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 0250
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
2875 MICHELLE DRIVE
SUITE 110
IRVINE, CA 92606

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)* 01 MAR 2010
Applicant's or agent's file reference D1:01622.PCT	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US 10/20372	International filing date *(day/month/year)* 07 January 2010 (07.01.2010)
Applicant DIVX, INC.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 8270

   For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90*bis*.1 and 90*bis*.3, respectively, before the completion of the technical preparations for international publication.

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until **30 months** from the priority date (in some Offices even later); otherwise, the applicant must, within **20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

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

Form PCT/ISA/220 (January 2004) *(See notes on accompanying sheet)*

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference D1-01622 PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 10/20372	International filing date *(day/month/year)* 07 January 2010 (07.01.2010)	(Earliest) Priority Date *(day/month/year)* 07 January 2009 (07.01.2009)
Applicant DIVX, INC.		

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 0252
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 10/20972

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 15/16 (2010.01)
USPC - 709/217
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: 709/217

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 707/104.1; 715/205

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
pubWEST(PGPB,USPT,USOC,EPAB,JPAB); googleScholar
Search Terms Used: content/tag/metadata server, media guide/menu, content description/recommendation, metadata, IMDB, guide, menu, chapters, subtitles, DivX TV, IPTV, BBC iPlayer, DivX, online TV

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2008/0195664 A1 (MAHARAJH et al.) 14 August 2008 (14.08.2008) Entire document, especially: Abstract, para [0006], [0007], [0012]-[0014], [0028], [0041], [0042], 0161], [0164], [0166], [0174], [0184], [0200], [0223], [0329], [0534]-[0538] and Fig. 1, 2, 12, 50	19-22 --- 1-18
Y	US 2008/0086456 A1 (RASANEN et al.) 10 April 2008 (10.04.2008) Entire document, especially: Abstract, para [0009], [0012], [0034], [0052], [0085], [0088], [0093], [0112]-[0114], Fig. 1, 3, 11	1-18
A	US 2008/0005175 A1 (BOURKE et al.) 03 January 2008 (03.01.2008)	1-22
A	US 2008/0086747 A1 (RASANEN et al.) 10 April 2008 (10.04.2008)	1-22
A	US 2008/0066099 A1 (BRODERSEN et al.) 13 March 2008 (13.03.2008)	1-22

☐ 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
10 February 2009 (10.02.2009)	01 MAR 2010
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: PATRICK Y. IKEHARA
KAUTH, POMEROY, PECK & BAILEY LLP
2875 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)*	01 MAR 2010

Applicant's or agent's file reference	FOR FURTHER ACTION
D1:01622.PCT	See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 10/20372	07 January 2010 (07.01.2010)	07 January 2009 (07.01.2009)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 15/16 (2010.01)
USPC - 709/217

Applicant DIVX, INC.

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.

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	10 February 2009 (10.02.2009)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2009)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 10/20372

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:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 10/20372

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	1-18	YES
	Claims	19-22	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-22	NO
Industrial applicability (IA)	Claims	1-22	YES
	Claims	None	NO

2. Citations and explanations:

Claims 19-22 lack novelty under PCT Article 33(2) as being obvious over US 2008/0195664 A1 to Maharajh et al. (hereinafter 'Maharajh').

As to claim 19, Maharajh teaches a method of accessing content distributed throughout a network (optimization of content delivery, see para [0006]; architecture 804 may be readily scaled through a server based, modular computing environment that may support a high degree of encoding concurrency, see para [0164]; one or more network components, such as a server, a streaming protocol server, and the like, see para [0200]; FIG. 50 provides an embodiment of the architecture for the media platform 100, see para [0534] and Fig. 50), the method comprising: generating a tag referencing a piece of content accessible via a content server using a tagging device (checking the content database to look up a content file name by ID, see para [0538]; optimization of content delivery, facilitating access to content on a mobile device, ingesting content, storing content and metadata in a file format optimized for use on a mobile platform, see para [0006]; content delivery is based at least in part on the automated tag processing, see Abstract); adding the generated tags to a searchable database of tags by a tag server (A system of automated content tagging on a mobile media platform may comprise an ingestion facility; a tagging facility; and a recommendation engine. A system of targeting advertising content on a mobile media platform, may comprise providing tagged content; providing an ad fulfillment engine which targets advertising content based on at least one tag, see para [0014]); and accessing the database, selecting at least one tag and retrieving content from the content server referenced by the retrieved tag by a playback device (user mobile handsets 5002, third party components may include an ad server database 5026, a user profile database 204, consumption data store 5012, streaming server 5020, see para [0534]-[0536] and Fig. 50).

As to claim 20, Maharajh teaches each tag includes an identifier of the content and location information of the content (FIG. 12 depicts automated tagging with location information and intelligence, see para [0028] and Fig. 12).

As to claim 21, Maharajh teaches the identifier is a unique database identifier and the location information is associated to a uniform resource identifier (Tagging 108 may also including functional data such as URLs, addresses, contact information, actions, and the like, see para [0184]).

As to claim 22, Maharajh teaches the identifier and the location information is substantially smaller in size than the content (tag 108 may be an explicit component of a file, such as metadata, a header, an inter-clip identifier, and the like, see para [0174]).

(See supplemental box)

Form PCT/ISA/237 (Box No. V) (July 2009)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 10/20372

Supplemental Box

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

Box V.2 - Citations and explanations

Claims 1-18 lack inventive step under PCT Article 33(3) as being obvious over Maharajh in view of US 2008/0086456 A1 to Rasanen et al. (hereinafter 'Rasanen').

As to claim 1, Maharajh teaches a content system comprising: a content server configured to provide access to content (optimization of content delivery, see para [0006]; architecture 804 may be readily scaled through a server based, modular computing environment that may support a high degree of encoding concurrency, see para [0184]; one or more network components, such as a server, a streaming protocol server, and the like, see para [0200]; checking the content database to look up a content file name by ID, see para [0538]); a tag server including a searchable database of tags (tags may be metadata included in same file as the content, see para [0007]); a tagging device in network communication with the tag server and the content server (applying tags to the content and processing the content based on the tags, see para [0007]; content delivery is based at least in part on the automated tag processing, see Abstract), where the tagging device is configured to access content via the content server and to automatically generate at least one tag referencing the accessed content that is provided to the tag server for inclusion into the searchable database of tags (automated content tagging, see para [0012]; A system of automated content tagging on a mobile media platform may comprise an ingestion facility; a tagging facility; and a recommendation engine. A system of targeting advertising content on a mobile media platform, may comprise providing tagged content; providing an ad fulfillment engine which targets advertising content based on at least one tag, see para [0014]); and a playback device in network communication with the tag server and the content server (user mobile handsets 5002, third party components may include an ad server database 5026, a user profile database 204, consumption data store 5012, streaming server 5020, see para [0534]-[0536] and Fig. 50), where the playback device is configured to search the database (a user profile which favors sports content 128 may result in a higher ranking for content 128 search results for the Blue Jays baseball team than for the birds when a user searches for "blue jays" for his or her mobile device, see para [0329]), 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 (A system of tagging mobile content may comprise a mobile media platform for distribution of mobile content to mobile device users, may comprise providing tagged content; providing an ad fulfillment engine which targets advertising content based on at least one tag, see para [0013]-[0014]).
Maharajh does not expressly teach a content guide system.
However, Rasanen teaches a content guide system (online media guidance application, see para [0009] and Fig. 1) comprising: a content server configured to provide access to content (videos available on web servers 1116, see para [0093] and Fig. 11); a tag server including a searchable database of tags (Data store 1124 may store the metadata (e.g., title, description, URL, etc.) associated with each video from web servers 1116, see para [0093] and Fig. 11); a playback device in network communication with the tag server and the content server (equipment devices 1102, 1104, and 1106 are shown as through communications network 1114, see para [0088] and Fig. 11), where the playback device is configured to search the database (user may enter one or more search terms or keywords (e.g., in search bar 224), and the subset of videos may be determined based on a comparison of the keywords with the stored metadata associated with each video, see para [0114]), 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 (media content being displayed, see para [0034]).
It would have been obvious to one of ordinary skill in the art to combine the content guide system, as taught by Rasanen, with Maharajh because a guide simplifies the retrieval of content across a large number of sites and enables viewing of content on multiple devices, thus increasing the user-friendliness and range of applicability of the combined invention.

As to claim 2, Maharajh teaches each tag includes an identifier of the content and location information of the content (FIG. 12 depicts automated tagging with location information and intelligence, see para [0028] and Fig. 12).

As to claim 3, Maharajh teaches the identifier is a unique database identifier and the location information is associated to a uniform resource identifier (Tagging 108 may also including functional data such as URLs, addresses, contact information, actions, and the like, see para [0184]).

As to claim 4, Rasanen teaches the identifier and the location information is substantially smaller in size than the content (each video may be associated with one or more entries in the media guidance database, see para [0112]).

As to claim 5, Maharajh teaches the playback device is configured to request a tag referencing content stored on the content server to be added to or deleted from the database (other actions associated with content lifecycle tags 108 may include when to stalemate it, when to publish it, when it was published, when to remove it, when to delete it, see para [0161]).

As to claim 6, Maharajh teaches the network communication is through the Internet (content originating on the World Wide Web or the Internet, see para [0223]).

As to claim 7, Rasanen teaches the network communication is through a local area network (media guidance application settings across in -home devices, see para [0085]).

As to claim 8, Maharajh teaches the playback device is configured to receive content recommendation and the playback device is configured to request a tag referencing content to be added to the database based on the content recommendation (providing recommendations based on the tags, see para [0012]).

As to claim 9, Maharajh teaches a recommendation server configured to search through the database and to transmit content recommendations to the playback device (a recommendation engine, see para [0014]).

(See supplemental box)

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0257
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 10/20372

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 10, Rasanen teaches the content recommendation is based on a selection criteria and the playback device is configured to create the selection criteria (recommended video may be displayed by listing the title of the video 252, a graphical identifier for the video 254 with a ratings overlay 256, and a brief program description 258 of the video, recommended videos may be presented to the user by providing a format similar to listing 228, see para [0052] and Fig. 3).

As to claim 11, Maharajh teaches the playback device is configured to receive pre-cached portions of the content (feeding the mobile device 802 through a live or cached stream, see para [0165]).

As to claim 12, Maharajh teaches the content server is configured to obtain pre-cached portions of the content (The platform would obtain, transcode, and cache the requested content from the content provider site, see para [0165]).

As to claim 13, Rasanen teaches the tag server does not contain the content (Communications with the web server 1116 and media guidance data source 1118 may be exchanged over one or more communications paths, see para [0088] and Fig. 11).

As to claim 14, Rasanen teaches the content server stores a portion of the content (web server 1116 and media guidance data source 1118 may be integrated as one source device, see para [0088]).

As to claim 15, Maharajh teaches the tag does not include a temporal component (The tags may relate to digital rights management, The tags may be associated with various business models of the mobile media platform, see para [0007]).

As to claim 16, Maharajh teaches the tags are a subset of data within a database having data unrelated to the tags and the content in which the tags refer (metadata in a file format optimized for use on a mobile platform, integrating multiple billing systems, see para [0006]).

As to claim 17, Maharajh teaches the tags include at least one identifier associating the tags to a specific content guide within the database (selectable options within options region 126 may concern features related to program listings in grid 102, see para [0041]; display 200 is displayed a result of user selection of listing 118 in display 100, see para [0042] and Fig. 1-2).

As to claim 18, Rasanen teaches the database is larger in size than the database of tags (the set of online media that the guidance application provides guidance for is determined by crawling through a plurality of websites and obtaining information on media provided by each website. The obtained information may include metadata (e.g., title, runtime, description, etc.) corresponding to each video, see para [0012]).

Claims 1-22 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) (July 2009)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference D1.01940.PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 10/56733	International filing date *(day/month/year)* 15 November 2010 (15.11.2010)	(Earliest) Priority Date *(day/month/year)* 04 December 2009 (04.12.2009)
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. 2

   ☒ 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.

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 10/56733

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H04N 7/167 (2010.01)
USPC - 380/217
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 - 380/217

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 380/210; 380/239; 705/51 (keyword limited; terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Dialog; Google
Transmit, sent, deliver, transport, distrib, media, multimedia, video, content, encrypt, decrypt, crypt, encipher, decipher, scramble, process, algorithm, data, stream, bitstream, container, wrapper, file, digital, rights, management, DRM, header, user, metadata, data, heu

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2004/0081333 A1 (GRAB et al.) 29 April 2004 (29.04.2004), Para [0033], [0037]-[0042], [0047]-[0048], [0050], [0052], [0055]-[0056]	1-9 and 13-21 ---------- 10-12 and 22-25
Y	US 2003/0035546 A1 (JIANG et al.) 20 February 2003 (20.02.2003), Para [0021]	10-12 and 22-25
A	US 2003/0035545 A1 (JIANG) 20 February 2003 (20.02.2003)	10, 22, 25
A	US 2004/0105549 A1 (SUZUKI et al.) 03 June 2004 (03.06.2004)	1-25
A	US 2007/0255940 A1 (UENO) 01 November 2007 (01.11.2007)	1-25
A	US 2009/0097644 A1 (HARUKI) 16 April 2009 (16.04.2009)	1-25

☐ 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
03 January 2011 (03.01.2011)	14 JAN 2011
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
2875 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)*	14 JAN 2011
Applicant's or agent's file reference D1:01940.PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 10/56733	15 November 2010 (15.11.2010)	04 December 2009 (04.12.2009)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04N 7/167 (2010.01)
USPC - 380/217

Applicant DIVX, LLC

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	03 January 2011 (03.01.2011)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2009)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 10/56733

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:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 10/56733

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	10-12 and 22-25	YES
	Claims	1-9 and 13-21	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-25	NO
Industrial applicability (IA)	Claims	1-25	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-9 and 13-21 lack novelty under PCT Article 33(2) as being anticipated by US 2004/0081333 A1 to Grab et al. (hereinafter 'Grab').

As per claim 1, Grab discloses a method of playing back encrypted video on a playback device, where at least partially encrypted video data (Para [0033] -- selected portions of a stream) is contained within a container file (Para [0033] -- header data; Para [0040] -- tagged, synchronized frame decryption stream) and can be used to create an elementary bitstream using cryptographic information (Para [0033] -- encrypted material), which can be used to decrypt the at least partially encrypted video data (Para [0040]), the method comprising: obtaining the cryptographic information (Para [0040] -- encryption key); extracting the at least partially encrypted video data from the container file to create an elementary bitstream (Para [0038] -- marked frames; Para [0042]); enciphering the cryptographic information (Para [0047]); inserting the cryptographic information in the elementary bitstream (Para [0042], [0047]); providing the elementary bitstream to a video decoder (Para [0048]); extracting the cryptographic information from the elementary bitstream at the video decoder (Para [0048] -- parsing frames); deciphering the cryptographic information (Para [0048] -- decryption routine); decrypting the elementary bitstream with the cryptographic information (Para [0048] -- decrypting with appropriate decryption key); and decoding the elementary bitstream for rendering on a display device using the video decoder (Para [0048], [0052]).

As per claim 13, Grab further discloses a system for playback of encrypted video, where at least partially encrypted video data (Para [0033] -- selected portions of a stream) is contained within a container file (Para [0033] -- header data; Para [0040] -- tagged, synchronized frame decryption stream) and can be used to create an elementary bitstream using cryptographic information (Para [0033] -- encrypted material), which can be used to decrypt the at least partially encrypted video data (Para [0040]), comprising: a demultiplexer configured to extract the at least partially encrypted video data from the container file to create an elementary bitstream (Para [0038] -- marked frames; Para [0042]); and a video decoder configured to decrypt the elementary bitstream using the cryptographic information (Para [0048] -- decrypting with appropriate decryption key) and decode the elementary bitstream for rendering on a display device (Para [0048], [0052]); wherein the demultiplexer is configured to encipher the cryptographic information (Para [0047]) and insert the enciphered cryptographic information in the elementary bitstream (Para [0042], [0047]); and wherein the decoder is configured to extract enciphered cryptographic information from an elementary bitstream (Para [0048] -- parsing frames) and to decipher the cryptographic information (Para [0048] -- decryption routine).

As per claims 2 and 14, Grab further discloses wherein the cryptographic information is obtained from the container file (Para [0040] -- encryption key from synchronized frame decryption stream).

As per claims 3 and 15, Grab further discloses wherein the cryptographic information comprises: key information (Para [0040]); and information concerning at least a portion of the at least partially encrypted video data that is encrypted using the key information (Para [0038], [0040] -- encryption on/off status).

As per claims 4 and 16, Grab further discloses wherein the information concerning at least a portion of the at least partially encrypted video data is a reference to a block of encrypted data within an encoded frame of video that is encrypted using the key information (Para [0040] -- size of data field).

As per claims 5 and 17, Grab further discloses wherein the cryptographic information inserted in the elementary bitstream is delimited by an identifier (Para [0040] -- encryption on/off status); and the cryptographic information is inserted before the at least partially encrypted video data encrypted using the key information (Para [0050] -- frame decryption information).

As per claims 6 and 18, Grab further discloses wherein the cryptographic information is extracted using the identifier (Para [0048] -- parsing frames).

As per claims 7 and 19, Grab further discloses wherein the decrypting process is performed by using the key information to identify the encrypted portion of video data and decrypting the encrypted video data using the key information (Para [0048]).

As per claims 8 and 20, Grab further discloses wherein cryptographic information inserted in different locations within the elementary bitstream includes different key information (Para [0041] -- new key for new partially encrypted video data).

As per claims 9 and 21, Grab further discloses wherein the at least partially encrypted video data comprises: frames of encoded video (Para [0039]); wherein at least a portion of a plurality of the encoded frames is encrypted (Para [0039]).

-- Please See Supplemental Sheet --

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0263
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 10/56733

Supplemental Box

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

Continuation of:
Box V.2 Citations and Explanations

Claims 10-12 and 22-25 lack an inventive step under PCT Article 33(3) as being obvious over Grab in view of US 2003/0035546 A1 to Jiang et al. (hereinafter 'Jiang').

As per claims 10 and 22, Grab does not disclose wherein the enciphering process and the deciphering process are synchronized such that a delay in excess of a predetermined time between enciphering and deciphering results in the cryptographic information being unrecoverable. However, Jiang does disclose wherein the enciphering process and the deciphering process are synchronized such that a delay in excess of a predetermined time between enciphering and deciphering results in the cryptographic information being unrecoverable (Para [0021]). It would have been obvious to one of ordinary skill in the art to have modified Grab so as to include synchronized processes, as taught by Jiang, since such would help protect the encrypted bitstream by recognizing if any additional processes were being performed on the bitstream, thereby extending the delay above the predetermined time, and stopping access to the deciphering process.

As per claims 11 and 23, Grab does disclose wherein the enciphering process enciphers data by using a sequence of scrambling processes to scramble data (Para [0033], [0037], [0055] -- signal processing techniques).

As per claims 12 and 24, Grab does disclose wherein the deciphering process deciphers data by performing the inverse sequence of scrambling processes to the sequence used to scramble the data (Para [0056]).

As per claim 25, Grab further discloses method of playing back encrypted video on a playback device, where at least partially encrypted video data (Para [0033] -- selected portions of a stream) is contained within a container file (Para [0033] -- header data; Para [0040] -- tagged, synchronized frame decryption stream) and can be used to create an elementary bitstream using cryptographic information (Para [0033] -- encrypted material), which can be used to decrypt the at least partially encrypted video data (Para [0040]), the method comprising: obtaining the cryptographic information (Para [0040] -- encryption key), wherein the cryptographic information is obtained from the container file (Para [0040] -- encryption key from synchronized frame decryption stream); wherein the at least partially encrypted video data comprises: frames of encoded video (Para [0039]); and wherein at least a portion of a plurality of the encoded frames is encrypted (Para [0039]); wherein the cryptographic information comprises: key information (Para [0040]); and information concerning at least a portion of the least partially encrypted video data that is encrypted using the key information (Para [0038], [0040] -- encryption on/off status); wherein the information concerning at least a portion of the at least partially encrypted video data is a reference to a block of encrypted data within an encoded frame of video that is encrypted using the key information (Para [0040] -- size of data field); and wherein cryptographic information inserted in different locations within the elementary bitstream includes different key information (Para [0041] -- new key for new partially encrypted video data); extracting the at least partially encrypted video data from the container file to create an elementary bitstream (Para [0038] -- marked frames; Para [0042]), wherein the cryptographic information inserted in the elementary bitstream is delimited by an identifier (Para [0040] -- encryption on/off status); and wherein the cryptographic information is inserted before the at least partially encrypted video data encrypted using the key information (Para [0050] -- frame decryption information); enciphering the cryptographic information (Para [0047]); inserting the cryptographic information in the elementary bitstream (Para [0042], [0047]), wherein the cryptographic information is extracted using the identifier (Para [0048] -- parsing frames); providing the elementary bitstream to a video decoder (Para [0048]); extracting the cryptographic information from the elementary bitstream at the video decoder (Para [0048] -- parsing frames); deciphering the cryptographic information (Para [0048] -- decryption routine), wherein the enciphering process enciphers data by using a sequence of scrambling processes to scramble data (Para [0033], [0037], [0055] -- signal processing techniques); and wherein the deciphering process deciphers data by performing the inverse sequence of scrambling processes in the sequence used to unscramble data (Para [0056]); decrypting the elementary bitstream with the cryptographic information (Para [0048] -- decrypting with appropriate decryption key), wherein the decrypting process is performed by using the key information to identify the encrypted portion of video data and decrypting the encrypted video data using the key information (Para [0048]); and decoding the elementary bitstream for rendering on a display device using the video decoder (Para [0048], [0052]). Grab does not disclose wherein the enciphering process and the deciphering process are synchronized such that a delay in excess of a predetermined time between enciphering and deciphering results in the cryptographic information being unrecoverable. However, Jiang does disclose wherein the enciphering process and the deciphering process are synchronized such that a delay in excess of a predetermined time between enciphering and deciphering results in the cryptographic information being unrecoverable (Para [0021]). It would have been obvious to one of ordinary skill in the art to have modified the method of Grab so as to include synchronized processes, as taught by Jiang, since such would help protect the encrypted bitstream by recognizing if any additional processes were being performed on the bitstream, thereby extending the delay above the predetermined time, and stopping access to the deciphering process.

Claims 1-25 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 0264
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

SEARCH HISTORY

Application Number	PCT/US 10/56733
Search Conducted By	ANK
Search Approved By	PJN

US/IPC Classifications Searched	USPC - 380/217
Date Conducted	03 January 2011 (03.01.2011)

Documentation Searched	USPC - 380/210; 380/239; 705/51 (keyword limited; terms below)
Search Terms Used	Transmit, sent, deliver, transport, distrib, media, multimedia, video, content, encrypt, decrypt, crypt, encipher, decipher, scramble, process, algorithm, data, stream, bitstream, container, wrapper, file, digital, rights, management, DRM, header, user, metadata, data, heuristic, rule, playing, back, delay
Date Conducted	03 January 2011 (03.01.2011)

Electronic Database Searched	Dialog
Files Searched	2 - INSPEC; 6 - NTIS (National Technical Information Service); 63 - Transportation Research Information Services (TRIS); 65 - Inside Conferences; 118 - ICONDA - International Construction Database; 144 - PASCAL; 440 - Current Contents Search; 344 - Chinese Patent Abstracts in English; 348 - European Patents Fulltext; 349 - WIPO/PCT Patents Fulltext; 371 - French Patents; 652 - US Patents Fulltext (1971 – 1975); 654 - US Patents Fulltext (1976 – present)
Date Conducted	03 January 2011 (03.01.2011)

Search Logic:

```
S1      203  CL=380-217
S2     3208  CL=(380-210 OR 380-239 OR 705-51)
S3     3357  S1 OR S2
S4     1998  S3 AND (TRANSMIT? OR SEND??? OR DELIVER? OR TRANSPORT? OR
                 DISTRIB?)(N5)(MEDIA OR MULTIMEDIA OR VIDEO OR CONTENT)
```

SEARCH HISTORY

S5	1693	S4 AND (ENCRYPT? OR DECRYPT? OR CRYPT?)
S6	84	S5 AND (ENCIPHER? OR DECIPHER? OR SCRAMBLE)(N3)(PROCESS? OR ALGORITHM)
S7	24	S6 AND (MEDIA OR MULTIMEDIA OR VIDEO)(N5)(DATA(N3)STREAM OR BITSTREAM)
S8	32	S5 AND (CONTAINER OR WRAPPER)(N3)FILE
S9	325	S5 AND (DIGITAL(N3)RIGHTS(N3)MANAGEMENT OR DRM)
S10	158	S9 AND (HEADER OR USER OR METADATA)(N3)DATA
S11	44	S10 AND (HEURISTIC OR RULE)
S12	482686	(TRANSMIT? OR SEND??? OR DELIVER? OR TRANSPORT? OR DISTRIB?)(N5)(MEDIA OR MULTIMEDIA OR VIDEO OR CONTENT)
S13	40351	(MEDIA OR MULTIMEDIA OR VIDEO)(N5)(DATA(N3)STREAM OR BITSTREAM)
S14	5808	(ENCIPHER? OR DECIPHER? OR SCRAMBLE)(N3)(PROCESS? OR ALGORITHM)
S15	1777	S14 AND (TRANSMIT? OR SEND??? OR DELIVER? OR TRANSPORT? OR DISTRIB?)(N5)(MEDIA OR MULTIMEDIA OR VIDEO OR CONTENT)
S16	1145	S15 AND (ENCRYPT? OR DECRYPT? OR CRYPT?)
S17	225	S16 AND (MEDIA OR MULTIMEDIA OR VIDEO)(N5)(DATA(N3)STREAM OR BITSTREAM)
S18	218	S17 AND (ENCOD? OR DECOD?)
S19	14	S18 AND (DIGITAL(N3)RIGHTS(N3)MANAGEMENT OR DRM)

Electronic Database Searched	Google
Files Searched	Google Patents
Date Conducted	03 January 2011 (03.01.2011)

Search Logic:

Patents 401 - 464 on playing back encrypted video
Patents 1 - 74 on playing back encrypted video deciphering synchronized
Patents 1 - 13 on enciphering sync delay
Patents 101 - 174 on encrypted video enciphering
Patents 1 - 84 on encrypting video DRM container

Electronic Database Searched	Google
Files Searched	Google Scholar
Date Conducted	03 January 2011 (03.01.2011)

Search Logic:

playing back encrypted video
Results 1 - 10 of about 35,800

SEARCH HISTORY

playing back encrypted video deciphering synchronized
Results 1 - 10 of about 6,340
enciphering sync delay
Results 1 - 10 of about 154
encrypted video enciphering
Results 1 - 10 of about 1,410
encrypting video DRM container
Results 1 - 10 of about 954

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

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)* 08 MAY 2012
Applicant's or agent's file reference 02357AB.PCT	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US 11/67243	International filing date *(day/month/year)* 23 December 2011 (23.12.2011)
Applicant DIVX, LLC.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

Name and mailing address of the ISA/ 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 Telephone No. PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 02357AB.PCT	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 11/67243	International filing date *(day/month/year)* 23 December 2011 (23.12.2011)	(Earliest) Priority Date *(day/month/year)* 05 January 2011 (05.01.2011)
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:

SYSTEMS AND METHODS FOR PERFORMING SMOOTH VISUAL SEARCH OF MEDIA ENCODED FOR ADAPTIVE BITRATE STREAMING USING TRICK PLAY STREAMS

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.

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 11/67243

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H04N 7/12 (2012.01)
USPC - 348/404.1
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: 348/404.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC:348/408.1; 375/E7.198; 709/231; 725/62; 725/86

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PUBWEST (PGPB, USPT, EPAB, JPAB), Google Scholar, Google Patents; Search Terms: Encoded media, multimedia, video, trick-play, trickplay, visual-search, cluster element, Intra frame, group of pictures, GOP, Extensible Binary Markup Language, EBML, Hypertext Transfer Protocol, HTTP, alternate stream$, multiple bitrate$, multiple stream$

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2009/0169181 A1 (Priyadarshi et al.) 02 July 2009 (02.07.2009) entire document especially Abstract, para [0005], para [0039], para [0057]-[0062], para [0068]-[0075]	1-41
Y	US 2003/0231863 A1 (Eerenberg et al.) 18 December 2003 (18.12.2003) entire document especially Abstract, para [0016], para [0044], para [0155]-[0157].	1-41
Y	US 2009/0132599 A1 (Soroushian et al.) 21 May 2009 (21.05.2009) entire document especially Abstract, para [0028]-[0030], para [0045]-[0049]).	7-18, 26-39
A	US 2003/0231867 A1 (Gates et al.) 18 December 2003 (18.12.2003) entire document especially Abstract, para [0007]-[0008], para [0072]	1-41

☐ 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
24 April 2012 (24.04.2012)	08 MAY 2012
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)*	08 MAY 2012
Applicant's or agent's file reference 02357AB.PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 11/67243	23 December 2011 (23.12.2011)	05 January 2011 (05.01.2011)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04N 7/12 (2012.01)
USPC - 348/404.1

Applicant DIVX, LLC.

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 Fom 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	24 April 2012 (24.04.2012)	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 11/67243

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:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/67243

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	1-41	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-41	NO
Industrial applicability (IA)	Claims	1-41	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-6, 19-25, 40 and 41 lack an inventive step under PCT Article 33(3) as being obvious over US 2009/0169181 A1 to Priyadarshi et al. (hereinafter 'Priyadarshi') in view of US 2003/0231863 A1 to Eerenberg et al. (hereinafter 'Eerenberg').

As to claim **1**, Priyadarshi discloses a method of performing visual search of encoded media using a trick play stream (see para [0057]-[0058]), where the media is encoded as a plurality of alternative streams used during normal playback (see para [0005], para [0059]) and a trick play stream used during visual search (see para [0057]-[0058]), the method comprising: requesting and buffering portions of video from at least one of the alternative streams using a playback device (see para [0068]-[0070]); decoding the buffered portions of video using a decoder on the playback device (see para [0072]); receiving at least one user instruction directing the playback device to perform a visual search of the media ('The user interface of the media player allows the user to interact with the media file, e.g., provide trick-play requests' see para [0072]); requesting and buffering portions of video from the trick play stream using the playback device (see para [0070]-[0072]); and decoding the buffered portions of the trick play stream using a decoder on the playback device (see para [0072]) but does not specifically disclose buffering portions of video. However, Eerenberg specifically discloses buffering portions of video in para [0155]-[0157]. It would have been obvious to one of ordinary skill in the art to add Eerenberg's method of buffering portions of video to Priyadarshi's method of performing visual search of encoded media using a trick play stream in order to improve user experience during smooth forward and reverse operations, in streaming playback scenarios (Priyadarshi: see para [0059]).

As to claim **2**, Priyadarshi discloses a method further comprising measuring the current streaming conditions by measuring the time taken to receive requested portions of a stream from the time at which the portions were requested ('application enhancement tracks are derived from the main content that they are associated with. They are typically encoded to aid the performance of one or more functions related to the content, such as visual-search, or content-preview' see para [0071]-[0075]).

As to claim **3**, Priyadarshi discloses a method wherein requesting and buffering portions of video from at least one of the alternative streams using a playback device further comprises requesting and buffering portions of video from at least one of the alternative streams based upon the bitrates of the alternative streams and the measured streaming conditions using a playback device ('better user experience during smooth forward and reverse operations, in both optical as well as streaming playback scenarios' see para [0059]-[0062]).

As to claim **4**, Eerenberg discloses a method wherein each frame of the trick play stream is an intra frame starting a closed group of pictures [GOP] (see Abstract).

As to claim **5**, Priyadarshi discloses a method wherein: the at least one user instruction specifies the rate and direction of the visual search; and requesting and buffering potions of video from the trick play stream using the playback device further comprises requesting frames from the trick play stream based upon the rate and direction of the visual search specified by the at least one user instruction ('smooth visual-search capability in both the forward and reverse directions' see para [0008]).

As to claim **6**, Priyadarshi discloses a method wherein: the alternative streams and the trick play stream are stored in separate container files; and requesting portions of video from a stream further comprising requesting portions of files from remote servers via Hypertext Transfer Protocol [HTTP] byte range requests using the playback device (see para [0070]).

As to claim **19**, Eerenberg discloses a method further comprising modifying the time stamps of the buffered portions of the trick play stream prior to providing the portions of the trick play stream to the decoder for decoding (see para [0044]).

As to claim **20**, Priyadarshi discloses a method further comprising retrieving a top level index file using the playback device that identifies the alternative streams used during normal playback of the encoded video and identifies the trick play stream used during visual search of the encoded video (see para [0071]-[0073]).

--(Continued in Supplemental Box)--

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/67243

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 21, Priyadarshi discloses a playback device configured to perform visual search of encoded media using a trick play stream (see para [0057]-[0058]), where the media is encoded as a plurality of alternative streams used during normal playback (see para [0005], para [0059]) and a trick play stream used during visual search (see para [0057]-[0058]), the playback device comprising: a processor configured to communicate with memory, where the processor is configured by a playback client application stored in the memory (see para [0069]-[0070]; wherein the playback client application configures the processor to: request portions of video from at least one of the alternative streams from a remote server and buffer the requested portions of video in memory (see para [0068]-[0070]); decode the buffered portions of video (see para [0072]); receive at least one user instruction directing the playback device to perform a visual search of the media (see para [0057]-[0058]); request portions of video from the trick play stream from a remote server and buffer requested portions of video from the trick play stream (see para [0070]-[0072]); and decode the buffered portions of the trick play stream (see para [0072]) but does not specifically disclose buffering portions of video. However, Eerenberg specifically discloses buffering portions of video in para [0155]-[0157]. It would have been obvious to one of ordinary skill in the art to add Eerenberg's method of buffering portions of video to Priyadarshi's method of performing visual search of encoded media using a trick play stream in order to improve user experience during smooth forward and reverse operations, in streaming playback scenarios (Priyadarshi: see para [0059]).

As to claim 22, Priyadarshi discloses method of encoding source video as a plurality of alternative streams and a trick play stream using a source encoder (see para [0005], para [0057]-[0059]), the method comprising: repeatedly selecting a portion of the source video using the source encoder (see para [0010], para [0040]); transcoding the selected portion of the source video into a plurality of alternative portions of encoded video using the source encoder (see para [0005], para [0040], para [0059]); transcoding the selected portion of the source video into a portion of trick play stream video for inclusion in a trick play stream using the source encoder, where the portion of trick play stream video is encoded at a lower frame rate and a lower resolution than the source video ('The user interface of the media player allows the user to interact with the media file, e.g., provide trick-play requests' see para [0072]-[0073]); writing each of the alternative portions of encoded video to a separate container file using the source encoder (see para [0049]-[0051]); writing the trick play stream to a separate container file using the source encoder (see para [0049]-[0051]); and adding an entry to an index that identifies the location of each frame in the portion of trick play stream video within the container file containing the trick play stream (see para [0071]-[0073]) but does not specifically disclose where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame starting a closed group of pictures [GOP]. However, Eerenberg specifically discloses where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame starting a closed group of pictures [GOP] in Abstract. It would have been obvious to one of ordinary skill in the art to add Eerenberg's method of encoding parameters starting a GOP to Priyadarshi's method of performing visual search of encoded media using a trick play stream as the trick play GOP can be re-used for higher trick play video speeds (Eerenberg: see para [0016]).

As to claim 23, Priyadarshi discloses method wherein transcoding a selected portion of the source video into a portion of trick play stream video further comprises transcoding the selected portion so that each frame is an IOR frame('intra frame' see para [0005]).

As to claim 24, Priyadarshi discloses method wherein the selected portions of source video are selected based upon their duration ('range of encoded video content' see para [0039]).

As to claim 25, Priyadarshi discloses method wherein the selected portions of source video each have a duration of two seconds (see para [0024]-[0025], para [0054]-[0057]).

As to claim 40, Priyadarshi discloses a method further comprising creating a top level index file that identifies each of the container files containing the alternative streams used during normal playback of the encoded video and identifies the container file that includes the trick play stream used during visual search of the encoded video (see para [0070]-[0073]).

As to claim 41, Priyadarshi discloses a source encoder configured to encode source video as a plurality of alternative streams and a trick play stream (see para [0005], para [0057]-[0059]), the source encoder comprising: a processor configured to communicate with memory, the processor configured by a source encoder application stored in memory (see para [0043]); encoder (see para [0010], para [0040]); wherein the source encoder application configures the processor to: repeatedly select a portion of the source video using the source transcode the selected portion of the source video into a plurality of alternative portions of encoded video (see para [0005], para [0040], para [0059]); transcode the selected portion of the source video into a portion of trick play stream video for inclusion in a trick play stream using the source encoder, where the portion of trick play stream video is encoded at a lower frame rate and a lower resolution than the source video('The user interface of the media player allows the user to interact with the media file, e.g., provide trick-play requests' see para [0072]-[0073]); write each of the alternative portions of encoded video to a separate container file using the source encoder (see para [0049]-[0051]); write the trick play stream to a separate container file using the source encoder (see para [0049]-[0051]); and add an entry to an index that identifies the location of each frame in the portion of trick play stream video within the container file containing the trick play stream(see para [0071]-[0073]) but does not specifically disclose where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame starting a closed group of pictures [GOP]. However, Eerenberg specifically discloses where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame starting a closed group of pictures [GOP] in Abstract. It would have been obvious to one of ordinary skill in the art to add Eerenberg's method of encoding parameters starting a GOP to Priyadarshi's method of performing visual search of encoded media using a trick play stream as the trick play GOP can be re-used for higher trick play video speeds (Eerenberg: see para [0016]).

--(Continued in Supplemental Box)--

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/67243

Supplemental Box

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

Box V, 2. Citations and explanations:

Claims 7-18 and 26-39 lack an inventive step under PCT Article 33(3) as being obvious over Priyadarshi in view of Eerenberg and in further view of 2009/0132599 A1 to Soroushian et al. (hereinafter 'Soroushian').

As to claim 7, Priyadarshi & Eerenberg disclose a method wherein the alternative streams and the trick play stream are stored but do not specifically disclose that they are stored in separate Extensible Binary Markup Language [EBML] container files. However, Soroushian discloses a method wherein the alternative streams and the trick play streams are stored in separate Extensible Binary Markup Language [EBML] container files (see para [0030], para [0042]). It would have been obvious to one of ordinary skill in the art to add Soroushian's method of storing streams in separate Extensible Binary Markup Language [EBML] container files to Priyadarshi & Eerenberg's method of performing visual search of encoded media using a trick play stream in order to increase the granularity of pointers or references to the cue points using multiple hierarchical index points (Soroushian: see para [0030]).

As to claim 8, Soroushian discloses a method wherein: each of the EBML container files comprises a plurality of Cluster elements, where each Cluster element contains a portion of encoded video; and the portion of encoded video in each of the Cluster elements commences with an intra frame (see para [0029]-[0030], para [0045]-[0048]).

As to claim 9, Soroushian discloses a method wherein each Cluster element includes at least one closed group of pictures ('Block Group' see para [0048]).

As to claim 10, Soroushian discloses a method wherein the portions of encoded video in each of the Cluster elements of the alternative streams have the same duration ('Cue Time 153' see para [0045]-[0049]).

As to claim 11, Soroushian discloses a method wherein the portions of encoded video in each of the Cluster elements of the alternative streams have a 2 second duration and each of the Cluster element of the trick play stream include 64 frames (see para [0007]-[0010], para [0045]-[0049]).

As to claim 12, Soroushian discloses a method wherein each Cluster element contains a time code and each encoded frame of the portion of encoded video contained within the Cluster element is contained within a separate element ('The implementation of the hierarchy structure can be inclusive or exclusive, meaning that the data in each layer can be repeated in the other layers or each layer may contain unique position information. In addition, the number of elements at each layer of a hierarchy and the total number of layers can be pre-determined, limited based on pre-determined values, or unbounded' see para [0028]-[0029]).

As to claim 13, Eerenberg discloses a method wherein the first element containing a frame in the Cluster element contains the intra frame (see para [0014]-[0015]).

As to claim 14, Soroushian discloses a method wherein the first element containing a frame is a BlockGroup element that contains a Block element, which specifies the time code attribute of the intra frame relative to the time code of the Cluster element (see para [0048]).

As to claim 15, Eerenberg discloses a method wherein all of the elements that contain frames in the Cluster elements of the EBML container file containing the trick play stream contain intra frames (see para [0014]-[0015]).

As to claim 16, Soroushian discloses a method wherein the EBML container file containing the trick play stream includes at least one modified Cues element containing an index that references Clusters elements containing portions of encoded video within the EBML container file and the elements containing frames within the referenced Clusters elements (see para [0029]-[0030], para [0045]-[0048]).

As to claim 17, Soroushian discloses a method further comprising: retrieving the modified Cues element using the playback device; and identifying frames to retrieve from the EBML container file based upon a visual search rate using the Cues element; wherein requesting and buffering potions of video from the trick play stream using the playback device further comprises requesting and buffering elements that contain frames from the EBML container file containing the trick play stream using the playback device (see para [0029]-[0030], para [0045]-[0048]).

As to claim 18, Soroushian discloses a method further comprising updating the size attribute of Cluster elements retrieved by the playback device (see para [0038]-[0039]).

As to claim 26, Priyadarshi & Eerenberg disclose a method wherein the alternative streams and the trick play stream are stored but do not specifically disclose that the container files containing the alternative streams and the trick play stream are Extensible Binary Markup Language [EBML] container files. However, Soroushian discloses a method wherein wherein the container files containing the alternative streams and the trick play stream are Extensible Binary Markup Language [EBML] container files (see para [0030], para [0042]). It would have been obvious to one of ordinary skill in the art to add Soroushian's method of storing streams in separate Extensible Binary Markup Language [EBML] container files to Priyadarshi & Eerenberg's method of performing visual search of encoded media using a trick play stream in order to increase the granularity of pointers or references to the cue points using multiple hierarchical index points (Soroushian: see para [0030]).

--(Continued in Supplemental Box)--

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/67243

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 27, Soroushian discloses a method wherein: the element of the EBML container file to which each alternative portion of encoded video is written is a Cluster element; and each Cluster element to which each of the alternative portions of encoded video is written is assigned the same time code (see para [0029]-[0030], para [0045]-[0048]).

As to claim 28, Soroushian discloses a method wherein the element of the EBML container file to which the portion of trick play stream video is written is a Cluster element (see para [0029]-[0030], para [0045]-[0048]).

As to claim 29, Soroushian discloses a method wherein the frames of each portion of encoded video are contained within elements within the Cluster element (see para [0029]-[0030], para [0045]-[0048]).

As to claim 30, Soroushian discloses a method wherein the first element that contains a frame in the Cluster element contains the intra frame (see para [0029]-[0030], para [0045]-[0048]).

As to claim 31, Soroushian discloses a method wherein the first element that contains a frame is a BlockGroup element that contains a Block element, which specifies the time code attribute of the intra frame relative to the time code of the Cluster element (see para [0048]).

As to claim 32, Eerenberg discloses a method wherein each frame in the portion of trick play stream video is an intra frame (see para [0014]-[0015]).

As to claim 33, Soroushian discloses a method wherein each element containing a frame in the Cluster element is a BlockGroup element containing the portion of trick play stream video contains a Block element, which specifies the time code attribute of the intra frame relative to the time code of the Cluster element (see para [0048]).

As to claim 34, Soroushian discloses a method wherein adding an entry to an index that identifies the location of each frame in the portion of trick play stream video within the container file containing the trick play stream, further comprises adding the location of each BlockGroup element in the Cluster element containing the portion of trick play stream video to the index for the EBML container file containing the trick play stream (see para [0042]).

As to claim 35, Soroushian discloses a method further comprising packing the index for the EBML container file containing the trick play stream into the EBML container file containing the trick play stream (see para [0042]).

As to claim 36, Soroushian discloses a method wherein each index comprises a Cues element (see para [0042]-[0043]).

As to claim 37, Soroushian discloses a method wherein each Cues element includes a CuePoint element that points to the location of the Cluster element containing the portion of trick play stream video within the EBML file containing the trick play stream; and each CuePoint element comprises a plurality of elements that point to the BlockGroup elements within the Cluster element pointed to by the CuePoint element (see para [0042]-[0047]).

As to claim 38, Soroushian discloses a method further comprising writing an element to each of the EBML container files specifying a set of encoding parameters (see para [0030], para [0042]-[0044]).

As to claim 39, Eerenberg discloses a method wherein the set of encoding parameters includes at least one parameter selected from the group consisting of frame rate, frame height, frame width, sample, aspect ratio, maximum bitrate, and minimum buffer size (see para [0061]]).

Claims 1-41 have industrial applicability as defined by PCT Article 33(4), because the subject matter 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 02549 PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2013/043181	International filing date *(day/month/year)* 29 May 2013	(Earliest) Priority Date *(day/month/year)* 28 June 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 0277
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/043181

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H04N 5/783 (2013.01)
USPC - 386/343
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)
IPC(8) - G06F 21/00; H04L 9/00; H04N 5/00; 5/783 (2013.01)
USPC - 386/343; 241; 709/219; 725/105; 38

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
CPC - G06F 21/00; H04L 9/00; H04N 5/00; 5/783 (2013.01)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Google, Orbit, Google Patents

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
Y	EP 1 056 273 A2 (CORNELIO et al) 29 November 2000 (29.11.2000) entire document	1-20
Y	US 6,038,257 A (BRUSEWITZ et al) 14 March 2000 (14.03.2000) entire document	1-20
Y	US 2011/0191803 A1 (BALDWIN et al) 04 August 2011 (04.08.2011) entire document	3, 5, 10, 17, 18
Y	US 2009/0138216 A1 (SOROUSHIAN et al) 28 May 2009 (28.05.2009) entire document	8
Y	WO 2011/103364 A1 (THORWIRTH) 25 August 2011 (25.08.2011) entire document	9, 12, 15

☐ 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
27 November 2013	06 DEC 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: Blaine R. Copenheaver 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, SUITE 1050
ANAHEIM, CA 92806

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	06 DEC 2013
Applicant's or agent's file reference: 02549.PCT	FOR FURTHER ACTION: See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2013/043181	29 May 2013	28 June 2012

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04N 5/783 (2013.01)
USPC - 386/343

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	27 November 2013	Blaine R. Copenheaver 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/US2013/043181

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 0280
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/043181

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	1-20	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

See Supplemental Box

Form PCT/ISA/237 (Box No. V) (July 2011)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/043181

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
Claims 1, 2, 4, 6, 7, 11, 13, 14, 16, 19, 20, lack an inventive step under PCT Article 33(3) as being obvious over Cornelio et al., hereinafter referred to as Cornelio in view of Brusewitz et al., hereinafter referred to as Brusewitz.

Regarding claims 1, 19, 20, Cornelio discloses a method for fast startup of video playback of encoded media using at least two video streams, where the media is encoded as at least a first video stream and a second video stream, the method comprising [claims 1, 19] (a method which includes a video encoder 106 that dynamically adjusts the compression ratio, para 0028; by selecting the play button, a play request is sent and in response to the play request the video encoder 106 decodes the video stream and initiates the playing of the video at a current selected high quality image [startup of video playback], para 0082; the server 132 consists of video files 134 and 140, wherein the images of the video file 140 have a higher resolution higher quality than compared to video file 134, and when switching the input file at the client 110 the video transmitter 136 begins transmission from the video file 140 [second video stream] at a frame that corresponds to the last frame sent from video file 134 [first video stream], and the switching does cause a skip in the video as it is viewed at the client [interpreted as fast startup of video playback], para 0033, 0036, 0037), a network interface; memory; and a processor, wherein the processor is configured by a playback application to [claim 19] (a processor 122 executes sequences of instructions contained in the dynamic memory of client 110, to decode a video stream and transmit to the display 112 for playback, para 0022, 0023, 0025) a machine readable medium containing processor instructions, where execution of the instructions by a processor causes the processor to perform a process [claim 20] (a processor 122 executes sequences of instructions contained in the dynamic memory of client 110, to decode a video stream and transmit to the display 112 for playback, para 0022, 0023, 0025) comprising.
identifying a location within the first video stream at which to commence playback using a playback device (the user provides an input to switch between transmission rates of a video, upon which the video transmitter 136 begins transmission from the video file 140 at a frame that corresponds to the last frame sent [identifying a location] from video file 134 [first video stream], para 0036, 0037; a user selects a pause button to pause the playback of a video, and upon which the processor 122 transmits a message to the server 132, the message includes data that identifies a particular frame displayed in the video image 114, in response to message the video selector 130 locates a corresponding frame associated with the selected frame within the least compressed video file and sends it to the client as a snapshot [as the switch causes the playback from the identified frame corresponding to the location it is interpreted as location at which to commence playback], para 0039);
identifying a frame of video in the second video stream that corresponds with the identified location in the first video stream using the playback device (the server 132 stores data that indicates the correlation between the frames in video file 134 and the frames in video file 140, and when switching the video transmitter 136 begins transmission from the video file 140 at a frame [identifying a frame in the second video stream] that corresponds to the last frame sent from video file 134 [identified location in the first video stream], para 0036, 0037; the processor 122 transmits a message to the server 132, the message includes data that identifies a particular frame displayed in the video image 114, in response to message the video selector 130 locates a corresponding frame [corresponds with the identified location] associated with the selected frame [identifying a frame of video in the second video stream] within the least compressed video file and sends it to the client as a snapshot, para 0039);
requesting the identified frame of video in the second video stream using the playback device (when switching the video transmitter 136 begins transmission from the video file 140 [second video stream] at a frame that corresponds to the last frame sent from video file 134 [transmitting the identified frame of the video file 140 corresponding to the video file 134 is interpreted as requesting the identified frame], para 0036, 0037; the processor 122 transmits a message to the server 132, in response to message the video selector 130 locates a corresponding frame [interpreted as requesting the identified frame] associated with the selected frame within the least compressed video file and sends it to the client as a snapshot, para 0039);
decoding the identified frame of video in the second video stream using the playback device (the processor 122 transmits a message to the server 132, in response to message the video selector 130 locates a corresponding frame [interpreted as requesting the identified frame] associated with the selected frame within the least compressed video file and sends it to the client as a snapshot, para 0039; fig.2 shows the step 224 wherein less compressed data [second video stream] for the selected frame of video [identified frame] is transmitted from the server to the client, and at step 228 the less compressed data is decoded by the client device to display a high resolution image/snapshot at the client device, para 0048, 0049);
displaying the decoded frame of video in the second video stream while buffering video from the first video stream (a user continues viewing the video in real time [interpreted as while buffering video from the first video stream] while selected snapshot are being prepared and set to the users device, para 0055; fig.2 shows the step 224 wherein less compressed data [second video stream] for the selected frame of video [identified frame] is transmitted from the server to the client, and at step 228 the less compressed data is decoded by the client device to display a high resolution image/snapshot at the client device, para 0048, 0049), but lacks the teaching of requesting and buffering video from the first video stream starting at the identified location using the playback device; decoding video from the first video stream using the playback device; and displaying the decoded video from the first video stream when the first video stream is sufficiently buffered for continuous playback.

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Regarding claims 1, 19, 20 (Cont.)

However, Cornelio teaches requesting from the first video stream starting at an identified location using the playback device (in response to receiving an image request, an initial image location is identified within a video stream, the image provider 404 identifies the image location 810 within the video stream 800 as the initial image location, at step 708 the initial image is retrieved and at step 710 the image is sent to the client device, para 0097-0099); decoding video from the first video stream using the playback device (at step 712 upon receiving the image data at client device 110, the browser 402 decodes and displays the image data as video image 516 on the video display 112, para 0100); and displaying the decoded video from the first video stream (at step 712 upon receiving the image data at client device 110, the browser 402 decodes and displays the image data as video image 516 on the video display 112, para 0100). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Cornelio to incorporate requesting from the first video stream starting at the identified location using the playback device; decoding video from the first video stream using the playback device; and displaying the decoded video from the first video stream into the invention of Cornelio. The motivation would have been to send higher quality of images over a limited bandwidth (see Cornelio para 0011).
Brusewitz is in the field of display and transmission of high resolution images on a video system (abstract) and teaches buffering video from the video stream and displaying the video stream when the video stream is sufficiently buffered for continuous playback (the low resolution copy of the detailed image is transmitted via the transmission channel 20 and buffer 23 to decoder 24, which displays the low resolution image. col 5, lines 54-65; figs.4A-4D shows a low resolution video image produced and displayed immediately prior to the display of the high resolution image segments, in fig.4B only the top portion of the low quality image is replaced with a higher quality image [buffering video from the video stream] and further in the fig.4C upon the completion of the high resolution download of the image, the entire high resolution image is displayed [the displaying of the low resolution image by continuously/gradually improving the quality while the high resolution image is being downloaded is interpreted as displaying sufficiently buffered for continuous playback]. col.7, lines 30-58). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Brusewitz to incorporate requesting and buffering video from the first video stream starting at the identified location and displaying the decoded video from the first video stream when the first video stream is sufficiently buffered for continuous playback into the invention of Cornelio. The motivation would have been to diminish the viewer's perception of delay (see Brusewitz col.7, lines 27-29).

Regarding claim 2, Cornelio further teaches wherein the first video stream is encoded at a first bitrate, the second video stream is encoded at a second bitrate, and the first bitrate is smaller than the second bitrate (the storage 144 contains multiple versions of a video file and contains a video file 134 that has been pre compressed at a compression ratio lower resolution [first bitrate] and lower quality, and a second video file 140 that has been pre-compressed using a different lower compression ratio which is of higher resolution [second bitrate] and higher quality than the images represented in video file 134, para 0033). However, to establish first bitrate is smaller or greater than the second bitrate would have been a matter of design choice and would have been a known practice in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings to incorporate the first bitrate is greater than the second bitrate into the invention of Cornelio. The motivation would have been to send higher quality of images over a limited bandwidth (see Cornelio para 0011).

Regarding claim 4, Cornelio further teaches wherein the first video stream is encoded at a first resolution, the second video stream is encoded at a second resolution, and the first resolution is smaller than the second resolution (the storage 144 contains multiple versions of a video file and contains a video file 134 that has been pre compressed at a compression ratio lower resolution [first resolution] and lower quality, and a second video file 140 that has been pre-compressed using a different lower compression ratio which is of higher resolution [second resolution] and higher quality than the images represented in video file 134, para 0033). However, to establish first resolution is smaller or greater than the second resolution would have been a matter of design choice and would have been a known practice in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings to incorporate the first resolution is greater than the second resolution into the invention of Cornelio. The motivation would have been to send higher quality of images over a limited bandwidth (see Cornelio para 0011).

Regarding claim 6, Cornelio further teaches wherein identifying a frame of video in the second video stream that corresponds with the identified location in the first video stream comprises determine a frame of video in the second stream that corresponds to the identified location within the first video stream at which to commence playback (the server 132 stores data that indicates the correlation between the frames in video file 134 and the frames in video file 140, and when switching the video transmitter 136 begins transmission from the video file 140 at a frame [identifying a frame in the second video stream] that corresponds to the last frame sent from video file 134 [identified location in the first video stream], para 0036, 0037), but lacks the teaching of comprises requesting an index of the second video stream and using the index to determine a frame of video in the second stream.
However, Cornelio teaches requesting an index of the video stream and using the index to determine a frame of video in the stream that corresponds to the identified location within the first video stream at which to commence playback (fig 8 shows a video stream 800 and includes image data 185-195 corresponding to image data locations 802-824, upon a request for a next image is received from a client 102 a direction indicator and the frame offset is utilized, when the next image is identified to have a frame offset of 3 and a direction indicator of "back", and upon the current image location corresponding to the image location 812 then the next image is identified to at location 806 with the image data 187). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Cornelio to incorporate requesting an index of the second video stream and using the index to determine a frame of video in the second stream into the invention of Cornelio. The motivation would have been to send higher quality of images over a limited bandwidth (see Cornelio para 0011).

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Regarding claim 7, Cornelio further teaches wherein the first video stream and the second video stream are stored in separate container files (the server 132 includes the storage 144 which stores video file 134 and video file 140 [separate container files], and contains multiple versions of a video file and contains a video file 134 that has been pre-compressed at a compression ratio lower resolution and lower quality [first video stream], and a second video file 140 that has been pre-compressed using a different lower compression ratio which is of higher resolution [second video stream] and higher quality than the images represented in video file 134, para 0033, 0036), but lacks the teaching of and requesting and buffering video from the first video stream starting at the identified location using a playback device further comprises requesting portions of files from at least one remote server via Hypertext Transfer Protocol (HTTP) byte range requests using the playback device.
However, Cornelio teaches requesting from the first video stream starting at the identified location using the playback device further comprises requesting portions of files from at least one remote server via Hypertext Transfer Protocol (HTTP) byte range requests using the playback device (in response to receiving an image request, an initial image location is identified within a video stream, the image provider 404 identifies the image location 810 within the video stream 800 as the initial image location, at step 712 upon receiving the image data at client device 110, the browser 402 decodes and displays the image data as video image 516 on the video display 112, para 0097-0100; the web server 102 and the client 110 are connected through the internet, and the client 110 includes video display 12 and a video decoder 108 implemented on a HTTP client such as a browser, and is dynamically linked to web browser [the client requests files from the web server via the HTTP browser interpreted as remote server via Hypertext Transfer Protocol byte range requests], para 0020, 0021). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Cornelio to incorporate requesting from the first video stream starting at the identified location using a playback device further comprises requesting portions of files from at least one remote server via Hypertext Transfer Protocol (HTTP) byte range requests using the playback device into the invention of Cornelio. The motivation would have been to send higher quality of images over a limited bandwidth (see Cornelio para 0011).
Brusewitz is in the field of display and transmission of high resolution images on a video system (abstract) and teaches comprises buffering video from the video stream (figs.4A-4D shows a low resolution video image produced and displayed immediately prior to the display of the high resolution image segments, in fig.4B only the top portion of the low quality image is replaced with a higher quality image and further in the fig 4C upon the completion of the high resolution download of the image, the entire high resolution image is displayed [the displaying of the low resolution image by continuously/gradually improving the quality while the high resolution image is being downloaded is interpreted as buffering video from the video stream], col.7, lines 30-58). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Brusewitz to incorporate decoding the buffered video and displaying the decoded video into the invention of Cornelio. The motivation would have been to diminish the viewer's perception of delay (see Brusewitz col.7, lines 53-57).

Regarding claim 11, Cornelio further teaches comprising configuring the playback device to decode the identified frame of video in the second video stream based upon the encoding of the identified frame of video in the second video stream (the processor 122 transmits a message to the server 132, in response to message the video selector 130 locates a corresponding frame [interpreted as requesting the identified frame] associated with the selected frame within the least compressed video file and sends it to the client as a snapshot, para 0039, fig.2 shows the step 224 wherein less compressed data [second video stream] for the selected frame of video [identified frame] is transmitted from the server to the client, and at step 228 the less compressed data is decoded by the client device to display a high resolution image/snapshot at the client device [as the identified frame of the video file is decoded it is inherent that the video was encoded], para 0048, 0049).

Regarding claim 13, Cornelio further teaches comprising decoding the video from the first video stream and displaying the decoded video (the image provider 404 identifies the image location 810 within the video stream 800 as the initial image location, at step 708 the initial image is retrieved and at step 710 the image is sent to the client device at step 712 upon receiving the image data at client device 110, the browser 402 decodes and displays the image data as video image 516 on the video display 112, para 0100), but lacks the teaching of decoding the buffered video.
Brusewitz is in the field of display and transmission of high resolution images on a video system (abstract) and teaches comprises decoding the buffered video and displaying the decoded video (the low resolution copy of the detailed image is transmitted via the transmission channel 20 and buffer 23 to decoder 24, which displays the low resolution image, col.5, lines 54-65; figs.4A-4D shows a low resolution video image produced and displayed immediately prior to the display of the high resolution image segments, in fig 4B only the top portion of the low quality image is replaced with a higher quality image and further in the fig.4C upon the completion of the high resolution download of the image, the entire high resolution image is displayed [the displaying of the low resolution image by continuously/gradually improving the quality while the high resolution image is being downloaded is interpreted decoding the buffered video], col.7, lines 30-58). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Brusewitz to incorporate decoding the buffered video and displaying the decoded video into the invention of Cornelio. The motivation would have been to diminish the viewer's perception of delay (see Brusewitz col.7, lines 53-57).

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Regarding claim 14, Cornelio further teaches comprising configuring the playback device to decode content from the first video stream based upon the encoding of the first video stream (the image provider 404 identifies the image location 810 within the video stream 800 as the initial image location, at step 708 the initial image is retrieved and at step 710 the image is sent to the client device at step 712 upon receiving the image data at client device 110, the browser 402 decodes and displays the image data as video image 516 on the video display 112 [as the identified frame of the video file is decoded it is inherent that the video was encoded interpreted as based upon the encoding of the first video stream], para 0100).

Regarding claim 16, Cornelio further teaches displaying the decoded frame of video while buffering portions of video from the video stream further (a user continues viewing the video in real time [interpreted as while buffering video from the first video stream] while selected snapshot are being prepared and set to the users device, para 0055; fig.2 shows the step 224 wherein less compressed data [second video stream] for the selected frame of video [identified frame] is transmitted from the server to the client, and at step 228 the less compressed data is decoded by the client device to display a high resolution image/snapshot at the client device, para 0048, 0049), but lacks the teaching of displaying the decoded frame of video in the trick play stream comprises displaying the same decoded frame of video continuously until the portions of video from the video stream are adequately buffered for display
Brusewitz is in the field of display and transmission of high resolution images on a video system (abstract) and teaches comprises displaying the decoded frame of video continuously until the portions of video from the video stream are adequately buffered for display (the low resolution copy of the detailed image is transmitted via the transmission channel 20 and buffer 23 to decoder 24, which displays the low resolution image, col.5, lines 54-65; figs.4A-4D shows a low resolution video image produced and displayed immediately prior to the display of the high resolution image segments, in fig.4B only the top portion of the low quality image is replaced with a higher quality image and further in the fig.4C upon the completion of the high resolution download of the image, the entire high resolution image is displayed [the displaying of the low resolution image by continuously/gradually improving the quality while the high resolution image is being downloaded is interpreted as displaying the decoded frame of video continuously until video stream are adequately buffered], col.7, lines 30-58). Furthermore, to establish to display the same decoded frame continuously would have been a matter of design choice and would have been a known practice in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Brusewitz to incorporate displaying the decoded frame of video in the trick play stream while buffering portions of video from the video stream further comprises displaying the same decoded frame of video continuously until the portions of video from the video stream are adequately buffered for display into the invention of Cornelio. The motivation would have been to diminish the viewer's perception of delay (see Brusewitz col.7, lines 27-29).

Claims 3, 5, 10, 17, 18, lack an inventive step under PCT Article 33(3) as being obvious over Cornelio in view of Brusewitz and further in view of Baldwin et al , hereinafter referred to as Baldwin.

Regarding claim 3, Cornelio further teaches the second video stream (shown above in claim 1), but lacks the teaching of wherein the second video stream is a trick play stream and each frame of the second video stream is encoded as an intra frame
Baldwin is in the field of a trick mode support for video on demand with long intra frame intervals (title, abstract) and teaches wherein the video stream is a trick play stream and wherein frames of the video stream are encoded as an intra frame (fig.3 shows a trick mode implementation with multiple streams 302a-302e encoded with staggered intra frame intervals [interpreted as trick play stream], each shaded area represents an encoded intra frame, the video stream 302a represents media content encoded with an intra-frame interval of 10 seconds, para 0021-0024). Furthermore, to establish that each frame of the second video stream is encoded as an intra frame would have been a matter of design choice and would have been a known practice in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Baldwin to incorporate wherein the second video stream is a trick play stream and each frame of the second video stream is encoded as an intra frame into the invention of Cornelio. The motivation would have been to provide staggered intra frames to provide quicker responses when the server receives request it selects the nearest future intra frame (see Baldwin para 0007).

Regarding claim 5, Cornelio further teaches the second video stream (shown above in claim 1), but lacks the teaching of wherein the second video stream is a trick play stream and each frame of the second video stream is encoded as an intra frame.
Baldwin is in the field of a trick mode support for video on demand with long intra frame intervals (title, abstract) and teaches wherein the video stream is a trick play stream and wherein frames of the video stream are encoded as an intra frame (fig.3 shows a trick mode implementation with multiple streams 302a-302e encoded with staggered intra frame intervals [interpreted as second video stream is a trick play stream], each shaded area represents an encoded intra frame, the video stream 302a, 302b represents media content encoded with an intra-frame interval of 10 seconds, para 0021-0024). Furthermore, to establish that each frame of the second video stream is encoded as an intra frame would have been a matter of design choice and would have been a known practice in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Baldwin to incorporate wherein the second video stream is a trick play stream and each frame of the second video stream is encoded as an intra frame into the invention of Cornelio. The motivation would have been to provide staggered intra frames to provide quicker responses when the server receives request it selects the nearest future intra frame (see Baldwin para 0007).

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Regarding claim 10, Cornelio lacks the teaching of wherein the first video stream is selected from a plurality of alternative video streams. Baldwin is in the field of a trick mode support for video on demand with long intra frame intervals (title, abstract) and teaches wherein the first video stream is selected from a plurality of alternative video streams (a stream selector 112 controls selection of appropriate video streams based on client request, and selects one stream from a set of video streams, based on the user requests, if the user requests by selecting a play control function then the stream is selected from a set of normal rate forward playing video streams, and when the user selects a fast forward control function then a stream is selected from a set of fast forward streams [interpreted a alternative video streams], para 0016). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Baldwin to incorporate wherein the first video stream is selected from a plurality of alternative video streams into the invention of Cornelio. The motivation would have been to provide staggered intra frames to provide quicker responses when the server receives request it selects the nearest future intra frame (see Baldwin para 0007).

Regarding claim 17, Cornelio lacks the teaching of wherein the identified frame of video in the trick play stream is downloaded together with at least part of at least one subsequent frame in the stream.
Brusewitz is in the field of display and transmission of high resolution images on a video system (abstract) and teaches wherein the frame of video in the stream is downloaded together with at least part of at least one subsequent frame in the stream (figs.4A-4D shows a low resolution video image produced and displayed immediately prior to the display of the high resolution image segments, in fig.4B only the top portion of the low quality image is replaced with a higher quality image and further in the fig.4C upon the completion of the high resolution download of the image, the entire high resolution image is displayed [the displaying of the low resolution image by continuously/gradually improving the quality while the high resolution image is being downloaded is interpreted as frame of video in the stream is downloaded together with one subsequent frame in the stream], col.7, lines 30-58). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Brusewitz to incorporate wherein the identified frame of video in the trick play stream is downloaded together with at least part of at least one subsequent frame in the stream into the invention of Cornelio. The motivation would have been to diminish the viewer's perception of delay (see Brusewitz col.7, lines 27-29)
Baldwin is in the field of a trick mode support for video on demand with long intra frame intervals (title, abstract) and teaches wherein the identified frame of video stream is a trick play stream (fig.3 shows a trick mode implementation with multiple streams 302a-302e encoded with staggered intra frame intervals [interpreted as trick play stream], each shaded area represents an encoded intra frame, the video stream 302a represents media content encoded with an intra-frame interval of 10 seconds [identified frame], para 0021-0024). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Baldwin to incorporate the identified frame of video in the trick play stream into the invention of Cornelio. The motivation would have been to provide staggered intra frames to provide quicker responses when the server receives request it selects the nearest future intra frame (see Baldwin para 0007).

Regarding claim 18, Cornelio further teaches displaying the decoded frame of video while buffering portions of video from the video stream further (a user continues viewing the video in real time [interpreted as while buffering video from the first video stream] while selected snapshot are being prepared and set to the users device, para 0055; fig.2 shows the step 224 wherein less compressed data [second video stream] for the selected frame of video [identified frame] is transmitted from the server to the client, and at step 226 the less compressed data is decoded by the client device to display a high resolution image/snapshot at the client device, para 0048, 0049), but lacks the teaching of wherein displaying the decoded frame of video in the trick play stream further comprises displaying the same decoded frame of video continuously until the portions of video from the video stream are adequately buffered for display.
Brusewitz is in the field of display and transmission of high resolution images on a video system (abstract) and teaches comprises displaying the decoded frame of video continuously until the portions of video from the video stream are adequately buffered for display (the low resolution copy of the detailed image is transmitted via the transmission channel 20 and buffer 23 to decoder 24, which displays the low resolution image, col.5, lines 54-65; figs.4A-4D shows a low resolution video image produced and displayed immediately prior to the display of the high resolution image segments, in fig.4B only the top portion of the low quality image is replaced with a higher quality image and further in the fig.4C upon the completion of the high resolution download of the image, the entire high resolution image is displayed [the displaying of the low resolution image by continuously/gradually improving the quality while the high resolution image is being downloaded is interpreted as displaying the decoded frame of video continuously until video stream are adequately buffered], col.7, lines 30-58). Furthermore, to establish to display the same decoded frame continuously would have been a matter of design choice and would have been a known practice in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Brusewitz to incorporate displaying the decoded frame of video in the trick play stream while buffering portions of video from the video stream further comprises displaying the same decoded frame of video continuously until the portions of video from the video stream are adequately buffered for display into the invention of Cornelio. The motivation would have been to diminish the viewer's perception of delay (see Brusewitz col.7, lines 27-29).

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Claim 8 lacks an inventive step under PCT Article 33(3) as being obvious over Cornelio in view of Brusewitz and further in view of Soroushian et al., hereinafter referred to as Soroushian.

Regarding claim 8, Cornelio lacks the teaching of wherein the first video stream and the second video stream are stored in separate Extensible Binary Markup Language (EBML) container files.
Soroushian is in the field of to provide critical information or playback data included in a multimedia content to be decoded and presented (abstract) and teaches wherein the first video stream and the second video stream are stored in separate Extensible Binary Markup Language (EBML) container files (fig.4 shows a multimedia file 40 which includes Extensible Binary Markup Language (EBML) element 41 and further includes the tracks section 45 information which includes video data, playback data, para 0023). 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 wherein the first video stream and the second video stream are stored in separate Extensible Binary Markup Language (EBML) container files into the invention of Cornelio. The motivation would have been optimize the process of decoding and presenting partially available multimedia content including critical information (see Soroushian para 0007).

Claims 9, 12, 15, lack an inventive step under PCT Article 33(3) as being obvious over Cornelio in view of Brusewitz and further in view of Thorwirth.

Regarding claim 9, Cornelio further teaches comprising retrieving a file using the playback device that identifies the first video stream and the second video stream (a user selects a pause button to pause the playback of a video, and upon which the processor 122 transmits a message to the server 132, the message includes data [retrieving a file] that identifies a particular frame displayed in the video image 114, in response to message the video selector 130 locates a corresponding frame associated with the selected frame [that identifies first video stream and the second video stream] within the least compressed video file and sends it to the client as a snapshot, para 0039; the user provides an input to switch between transmission rates of a video, upon which the video transmitter 136 begins transmission from the video file 140 [second video stream] at a frame that corresponds to the last frame sent from video file 134 [first video stream], para 0036, 0037), but lacks the teaching of comprising retrieving a top level index file using the playback device.
Thorwirth is in the field of enhance the security of playlists composed for a client device with encoding information in the playlists (abstract) and teaches retrieving a top level index file using the playback device (the playlist encodes information using a sequence of links that refer to chunks, and each chunk differs in watermark information, the content retrieved [retrieving the encoding information] using a playlist exhibits an individual sequence of watermarked chunks that are encoded information [determine the encoding], para 0046; an index within a container file allows fast access to individual sections/chunks, and the chunks are retrieved by a client via the playlist and each is encoded at a different bitrate by the adaptive bitrate streaming system, the SMIL top level index file and the indexes within each of the container files provide a complete index to all of the alternative chunks for different sections of a piece of content, para 0009). 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 retrieving a top level index file using the playback device into the invention of Cornelio. The motivation would have been to provide enhanced security of content distribution using individualized playlists (see para 0018).

Regarding claim 12, Cornelio further teaches wherein configuring the playback device to decode the identified frame of video in the second video stream based upon the encoding of the identified frame of video in the second video stream (the processor 122 transmits a message to the server 132, in response to message the video selector 130 locates a corresponding frame [interpreted as requesting the identified frame] associated with the selected frame within the least compressed video file and sends it to the client as a snapshot, para 0039; fig.2 shows the step 224 wherein less compressed data [second video stream] for the selected frame of video [identified frame] is transmitted from the server to the client, and at step 228 the less compressed data is decoded by the client device to display a high resolution image/snapshot at the client device [as the identified frame of the video file is decoded it is inherent that the video was encoded interpreted as based upon the encoding of the second video stream], para 0048, 0049), but lacks the teaching of comprises using a top level index to locate encoding information for the second video stream and retrieving the encoding information to determine the encoding of the second video stream.
Thorwirth is in the field of enhance the security of playlists composed for a client device with encoding information in the playlists (abstract) and teaches using a top level index to locate encoding information for the video stream (in an adaptive streaming system the source media is often organized on a media server by using a top level index file pointing to a number of alternate streams that contain actual video and audio data, further the source media is encoded at multiple bit rates and the client device switches between streaming the different encodings depending on the available resources, para 0009) and retrieving the encoding information to determine the encoding of the video stream (the playlist encodes information using a sequence of links that refer to chunks, and each chunk differs in watermark information, the content retrieved [retrieving the encoding information] using a playlist exhibits an individual sequence of watermarked chunks that are encoded information [determine the encoding], para 0046; an index within a container file allows fast access to individual sections/chunks, and the chunks are retrieved by a client via the playlist and each is encoded at a different bitrate by the adaptive bitrate streaming system, the SMIL top level index file and the indexes within each of the container files provide a complete index to all of the alternative chunks for different sections of a piece of content, para 0009). 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 using a top level index to locate encoding information for the video stream and retrieving the encoding information to determine the encoding of the video stream into the invention of Cornelio. The motivation would have been to provide enhanced security of content distribution using individualized playlists (see para 0018).

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0287
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/043181

Supplemental Box

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

Regarding claim 15, Comello further teaches wherein configuring the playback device to decode content from the first video stream based upon the encoding of the first video stream (the image provider 404 identifies the image location 810 within the video stream 800 as the initial image location, at step 708 the initial image is retrieved and at step 710 the image is sent to the client device at step 712 upon receiving the image data at client device 110, the browser 402 decodes and displays the image data as video image 516 on the video display 112 [as the identified frame of the video file is decoded it is inherent that the video was encoded interpreted as based upon the encoding of the first video stream], para 0100), but lacks the teaching of comprises using a top level index to locate encoding information for the first video stream and retrieving the encoding information to determine the encoding of the first video stream.
Thorwirth is in the field of enhance the security of playlists composed for a client device with encoding information in the playlists (abstract) and teaches using a top level index to locate encoding information for the video stream (in an adaptive streaming system the source media is often organized on a media server by using a top level index file pointing to a number of alternate streams that contain actual video and audio data, further the source media is encoded at multiple bit rates and the client device switches between streaming the different encodings depending on the available resources, para 0009) and retrieving the encoding information to determine the encoding of the video stream (the playlist encodes information using a sequence of links that refer to chunks, and each chunk differs in watermark information, the content retrieved [retrieving the encoding information] using a playlist exhibits an individual sequence of watermarked chunks that are encoded information [determine the encoding], para 0046; an index within a container file allows fast access to individual sections/chunks, and the chunks are retrieved by a client via the playlist and each is encoded at a different bitrate by the adaptive bitrate streaming system, the SMIL top level index file and the indexes within each of the container files provide a complete index to all of the alternative chunks for different sections of a piece of content, para 0009). 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 using a top level index to locate encoding information for the video stream and retrieving the encoding information to determine the encoding of the video stream into the invention of Comello. The motivation would have been to provide enhanced security of content distribution using individualized playlists (see para 0018).

Claims 1-20 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.

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IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference D1-03336.PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US14/30747	International filing date *(day/month/year)* 17 March 2014 (17.03.2014)	(Earliest) Priority Date *(day/month/year)* 15 March 2013 (15.03.2013)
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.

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US14/30747

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 15/173 (2014.01)
USPC - 709/223, 226
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)
IPC(8): G06F 15/173, 12/00, 12/02, 15/16, 15/167, 21/00 (2014.01); USPC: 709/223, 226, 213, 224, 225, 234; 711/170, E12.001, E12.002; 705/51; CPC: H04L 41/0213, 29/08144, 29/08072, 29/06, 47/10; G06F 12/023, 12/0246, 3/067, 21/10

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A); ProQuest; IEEE/IEEEXplore; Google/Google Scholar; Search terms: Pool, group, content delivery network, user, customer, client, stream, transmit, send, content, media, video, music, song

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2012/0124191 A1 (LYON, B) 17 May 2012; abstract; paragraphs [0008], [0010], [0011], [0013]-[0015].	1, 8, 15 --- 2-7, 9-14, 16-21
Y	US 2007/0271385 A1 (DAVIS, A et al.) 22 November 2007; paragraphs [0029], [0031], [0051].	2, 3, 5, 9, 10, 12, 16, 17, 19
Y	US 2011/0191439 A1 (DAZZI, A et al.) 04 August 2011; paragraphs [0015], [0036], [0037].	4, 11, 18
Y	US 2012/0166633 A1 (BAUMBACK, M et al.) 28 June 2012; paragraphs [0068], [0069].	6, 7, 13, 14, 20, 21

☐ 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
30 July 2014 (30.07.2014)	22 AUG 2014
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 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
KPPB LLP
2400 E. Katella, Suite 1050
Anaheim, CA 92806
United States of America

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	22 AUG 2014
Applicant's or agent's file reference D1-03336.PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US14/30747	17 March 2014 (17.03.2014)	15 March 2013 (15.03.2013)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 15/173 (2014.01)
USPC - 709/223, 226

Applicant DIVX, LLC

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.

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	30 July 2014 (30.07.2014)	Shane Thomas 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/US14/30747

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:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/30747

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	2-7, 9-14, 16-21	YES
	Claims	1, 8, 15	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-21	NO
Industrial applicability (IA)	Claims	1-21	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1, 8, and 15 lack novelty under PCT Article 33(2) as being anticipated by US 2012/0124191 A1 (LYON).

As per claim 1, Lyon discloses a system for delivery of content (system for managing TCP anycast requests at content delivery network nodes; abstract; paragraph [0008]), the system comprising: processing circuitry (a processor configured to execute instructions stored on a memory coupled to the processor; paragraph [0008]) configured to: receive a request to stream the content, the request being received from a user equipment device (a request for live video content from an end user is routed by one or more ISP nodes to an appropriate CDN node (receive a request to stream the content, the request being received from a user equipment device); paragraph [0010], [0013]); determine a first location of the user equipment device (an ISP often routes the request to the geographically closest CDN node (determine a first location of the user equipment device); paragraph [0011], [0013]); determine a count of user equipment devices that are located at the first location and are currently streaming the content (requests for content from users are routed to the geographically closest CDN node and determines whether the CDN node has the capacity to service the request based on number of sessions currently being services by the CDN node (determine a count of user equipment devices that are located at the first location and are currently streaming the content); paragraphs [0013], [0014]); determine whether the count meets a threshold (it is determined at the CDN node whether it has the capacity to service the request to the large user base (determine whether the count meets a threshold); paragraphs [0013], [0014]); and responsive to determining that the count meets the threshold, add a first content delivery network to a pool of one or more content delivery networks that are used to stream the content (if CDN node 300 does not have the capacity to handle a new request (responsive to determining that the count meets the threshold), the request is redirected to another CDN node via a virtual tunnel to CDN node 314. CDN node 300 may include virtual tunnels to multiple another nodes of the CDN (add a first content delivery network to a pool of one or more content delivery networks that are used to stream the content); paragraphs [0014], [0015]).

As per claim 8, Lyon discloses a method for delivery of content (process for managing TCP anycast requests at content delivery network nodes; abstract; paragraph [0008]), comprising: receiving a request to stream the content, the request being received from a user equipment device (a request for live video content from an end user is routed by one or more ISP nodes to an appropriate CDN node (receiving a request to stream the content, the request being received from a user equipment device); paragraphs [0010], [0013]); determining a first location of the user equipment device (an ISP often routes the request to the geographically closest CDN node (determining a first location of the user equipment device); paragraphs [0011], [0013]); determining a count of user equipment devices that are located at the first location and are currently streaming the content (requests for content from users are routed to the geographically closest CDN node and determines whether the CDN node has the capacity to service the request based on number of sessions currently being services by the CDN node (determining a count of user equipment devices that are located at the first location and are currently streaming the content); paragraphs [0013], [0014]); determining whether the count meets a threshold (it is determined at the CDN node whether it has the capacity to service the request to the large user base (determining whether the count meets a threshold); paragraphs [0013], [0014]); and responsive to determining that the count meets the threshold, adding, by processing circuitry, a first content delivery network to a pool of one or more content delivery networks that are used to stream the content (if CDN node 300 does not have the capacity to handle a new request (responsive to determining that the count meets the threshold), the request is redirected to another CDN node via a virtual tunnel to CDN node 314 by a processor configured to execute instructions stored on a memory coupled to the processor. CDN node 300 may include virtual tunnels to multiple another nodes of the CDN (adding, by processing circuitry, a first content delivery network to a pool of one or more content delivery networks that are used to stream the content); paragraphs [0008], [0014], [0015]).

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/30747

Supplemental Box

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

-***-Continued from Box V: Citations and Explanations-***-

As per claim 15, Lyon discloses a non-transitory computer-readable medium containing computer-executable instructions that, when executed by a processor, cause the processor to perform a method for delivery of content (a computer program product embodied on a computer readable storage medium; and a processor, such as a processor configured to execute instructions stored on a memory coupled to the processor for managing TCP anycast requests at content delivery network nodes; abstract; paragraph [0008]), the method comprising: receiving a request to stream the content, the request being received from a user equipment device (a request for live video content from an end user is routed by one or more ISP nodes to an appropriate CDN node (receiving a request to stream the content, the request being received from a user equipment device); paragraphs [0010], [0013]); determining a first location of the user equipment device (an ISP often routes the request to the geographically closest CDN node (determining a first location of the user equipment device); paragraphs [0011], [0013]); determining a count of user equipment devices that are located at the first location and are currently streaming the content (requests for content from users are routed to the geographically closest CDN node and determines whether the CDN node has the capacity to service the request based on number of sessions currently being services by the CDN node (determining a count of user equipment devices that are located at the first location and are currently streaming the content); paragraphs [0013], [0014]); determining whether the count meets a threshold (it is determined at the CDN node whether it has the capacity to service the request to the large user base (determining whether the count meets a threshold); paragraphs [0013], [0014]); and responsive to determining that the count meets the threshold, adding a first content delivery network to a pool of one or more content delivery networks that are used to stream the content (if CDN node 300 does not have the capacity to handle a new request (responsive to determining that the count meets the threshold), the request is redirected to another CDN node via a virtual tunnel to CDN node 314. CDN node 300 may include virtual tunnels to multiple another nodes of the CDN (adding a first content delivery network to a pool of one or more content delivery networks that are used to stream the content); paragraphs [0014], [0015]).

Claims 2, 3, 5, 9, 10, 12, 16, 17, and 19 lacks an inventive step under PCT Article 33(3) as being obvious over Lyon in view of US 2007/0271385 A1 to DAVIS et al. (hereinafter "Davis").

As per claims 2, 9, and 16, Lyon discloses the system of claim 1, the method of claim 8, and the non-transitory computer readable medium of claim 15, respectively. However, Lyon does not disclose wherein the first content delivery network includes a first plurality of computing devices that are part of a first data center. Davis discloses wherein the first content delivery network includes a first plurality of computing devices that are part of a first data center (CDN mapping information maps end-user IP blocks to data centers that host CDN regions (content delivery network includes a first plurality of computing devices that are part of a first data center); paragraphs [0039], [0051]). It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified the system, the method, and the non-transitory computer readable medium of Lyon with the teaching of Davis, because by doing so, the system, the method, and the non-transitory computer readable medium of Lyon would enable an end user client to obtain access to contents on different CDN edge servers while preserving a session state.

As per claims 3, 10, and 17, the combination of Lyon and Davis discloses the system of claim 2, the method of claim 9, and the non-transitory computer readable medium of claim 16, respectively. Lyon further discloses the pool includes a second content delivery network (if CDN node 300 does not have the capacity to handle a new request, the request is redirected to another CDN node via a virtual tunnel to CDN node 314. CDN node 300 may include virtual tunnels to multiple another nodes of the CDN (the pool includes a second content delivery network); paragraphs [0014], [0015]). However, Lyon does not disclose the second content delivery network includes a second plurality of computing devices that are part of a second data center; and the second data center is different from the first data center. Davis discloses the second content delivery network includes a second plurality of computing devices that are part of a second data center (CDN mapping information maps end-user IP blocks to data centers that host CDN regions (content delivery network includes a first plurality of computing devices that are part of a first data center); paragraphs [0039], [0051]); and the second data center is different from the first data center (CDN region 500 includes data center 1 and CDN region 502 includes data center 2 (the second data center is different from the first data center); figure 5; paragraph [0045]). It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified the system, the method, and the non-transitory computer readable medium of Lyon with the teaching of Davis, because by doing so, the system, the method, and the non-transitory computer readable medium of Lyon would enable an end user client to obtain access to contents on different CDN edge servers while preserving a session state.

As per claims 5, 12, and 19, Lyon discloses the system of claim 1, the method of claim 8, and the non-transitory computer readable medium of claim 15, respectively. However, Lyon does not disclose wherein determining the first location of the user equipment device includes retrieving at least a portion of a Domain Name Service (DNS) record corresponding to the user equipment device, the portion being indicative of at least one of a network or a network domain the user equipment device is part of. Davis discloses wherein determining the first location of the user equipment device includes retrieving at least a portion of a Domain Name Service (DNS) record corresponding to the user equipment device, the portion being indicative of at least one of a network or a network domain the user equipment device is part of (a request for content is resolved through a CDNSP-managed DNS to identify a best region. When a request for the object is made, a customer's DNS system directs the name query to the CDNSP DNS request routing mechanism (determining the first location of the user equipment device includes retrieving at least a portion of a DNS record corresponding to the user equipment device, the portion being indicative of at least one of a network domain the user equipment device is part of); paragraph [0029]). It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified the system, the method, and the non-transitory computer readable medium of Lyon with the teaching of Davis, because by doing so, the system, the method, and the non-transitory computer readable medium of Lyon would easily identify the location of the device and find the best server for the device.

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/30747

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
-***-Continued from Previous Supplemental Box-***-

Claims 4, 11, and 18 lacks an inventive step under PCT Article 33(3) as being obvious over Lyon in view of US 2011/0191439 A1 to DAZZI et al. (hereinafter "Dazzi").

As per claims 4, 11, and 18, Lyon discloses the system of claim 1, the method of claim 8, and the non-transitory computer readable medium of claim 15, respectively. However, Lyon does not disclose wherein adding the first content delivery network to the pool includes providing an encoder with an identifier of the first content delivery network, the encoder being configured to encode the content to produce encoded content and disseminate the encoded content among content delivery networks in the pool. Dazzi discloses wherein adding the first content delivery network to the pool includes providing an encoder with an identifier of the first content delivery network (the media ingestion system may encode the obtained video file into a format supported by the content distribution system and assign an identifier which may be based on where the media content was stored on the data storage cluster (providing an encoder with an identifier of the content delivery network); paragraphs [0015], [0036]), the encoder being configured to encode the content to produce encoded content and disseminate the encoded content among content delivery networks in the pool (the media ingestion system may encode the obtained video file into a format supported by the content distribution system and replicates across multiple volumes of the data storage cluster based on a set of data which is associated with the media content (the encoder being configured to encode the content to produce encoded content and disseminate the encoded content among content delivery networks in the pool); paragraphs [0036], [0037]). It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified the system, the method, and the non-transitory computer readable medium of Lyon with the teaching of Dazzi, because by doing so, the system, the method, and the non-transitory computer readable medium of Lyon would protect the contents during the transmissions.

Claims 6, 7, 13, 14, 20, and 21 lack an inventive step under PCT Article 33(3) as being obvious over Lyon in view of US 2012/0166633 A1 to Baumback, et al. (hereinafter "Baumback").

As per claims 6, 13, and 20, Lyon discloses the system of claim 1, the method of claim 8, and the non-transitory computer readable medium of claim 15, respectively. However, Lyon does not disclose wherein the first content delivery network is selected from a plurality of available content delivery networks based on a quality of service metric corresponding to the first content delivery network. Baumback discloses wherein the first content delivery network is selected from a plurality of available content delivery networks based on a quality of service metric corresponding to the first content delivery network (the processing device identifies one or more DCN service providers, from a number of CDN service providers, to use in processing a resource request based on CDN selection criteria including CDN quality of service information (wherein the first content delivery network is selected from a plurality of available content delivery networks based on a quality of service metric corresponding to the first content delivery network); paragraphs [0068], [0069]). It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified the system, the method, and the non-transitory computer readable medium of Lyon with the teaching of Baumback, because by doing so, the system, the method, and the non-transitory computer readable medium of Lyon would provide the best quality of service to the users.

As per claims 7, 14, and 21, Lyon discloses the system of claim 1, the method of claim 8, and the non-transitory computer readable medium of claim 15, respectively. However, Lyon does not disclose wherein the first content delivery network is selected from a plurality of available content delivery networks based on a price corresponding to the first content delivery network. Baumback discloses wherein the first content delivery network is selected from a plurality of available content delivery networks based on a price corresponding to the first content delivery network (the processing device identifies one or more DCN service providers, from a number of CDN service providers, to use in processing a resource request based on CDN selection criteria including cost information associated with processing a resource request using a particular CDN (wherein the first content delivery network is selected from a plurality of available content delivery networks based on a price corresponding to the first content delivery network); paragraphs [0068], [0069]). It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified the system, the method, and the non-transitory computer readable medium of Lyon with the teaching of Baumback, because by doing so, the system, the method, and the non-transitory computer readable medium of Lyon would provide services to the users with lower costs.

Claims 1-21 have industrial applicability as defined by PCT Article 33(4) because the subject matter 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 03351AB.PCT	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US14/39852	International filing date *(day/month/year)* 28 May 2014 (28.05.2014)	(Earliest) Priority Date *(day/month/year)* 30 May 2013 (30.05.2013)
Applicant SONIC IP, INC.		

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 4 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.

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US14/39852

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

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:

-***-See Supplemental Page-***-

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-18

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US14/39852

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H04N 21/2387 (2014.01)
CPC - G06F 3/04817
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)
IPC(8) Classification(s): H04N 21/2387; H04N 11/04; H04L 12/28 (2014.01)
CPC Classification(s): G06F 3/04817; G06F 3/04855; G11B 27/005

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A); Google/ GooglePatents; IEEE; ProQuest.
Keywords: video; streaming; trick play; playlist; time code.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2012/0170642 A1 (BRANESS, J et al.) 5 July 2012; Abstract; paragraphs [0008], [0023], [0027], [0070].	1, 3-5, 7, 9-11, 13 and 15-17 --- 2, 6, 8, 12, 14 and 18
Y	US 2013/0019273 A1 (MA, K et al.) 17 January 2013; Abstract; paragraphs [0007], [0031].	2, 8 and 14
Y	US 2012/0311094 A1 (BIDERMAN, D et al.) 6 December 2012; Abstract; paragraphs [0052], [0139], [0144].	6, 12 and 18
A	US 2013/0128962 A1 (RAJGOPALAN, S et al.) 23 May 2013; whole document.	1-18

☐ 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
21 October 2014 (21.10.2014)	05 DEC 2014
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 PCT OSP: 571-272-7774

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US14/39852

-***-Continued from Box III: Lack of Unity of Invention-***-
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: Jason D. Wolfe
KPPB LLP
2400 E. Katella, Suite 1050
Anaheim, CA 92806
United States of America

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	05 DEC 2014
Applicant's or agent's file reference 03351AB.PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US14/39852	28 May 2014 (28.05.2014)	30 May 2013 (30.05.2013)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04N 21/2387 (2014.01)
CPC - G06F 3/04817

Applicant SONIC IP, 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.

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	21 October 2014 (21.10.2014)	Shane Thomas 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/US14/39852

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 0301
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/39852

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:

   ☐ paid additional fees.

   ☐ paid additional fees under protest and, where applicable, the protest fee.

   ☐ paid additional fees under protest but the applicable protest fee was not paid.

   ☒ not paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

   ☐ complied with.

   ☒ not complied with for the following reasons:

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.

4. Consequently, this opinion has been established in respect of the following parts of the international application:

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-18

Form PCT/ISA/237 (Box No. IV) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/39852

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	2, 6, 8, 12, 14 and 18	YES
	Claims	1, 3-5, 7, 9-11, 13 and 15-17	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-18	NO
Industrial applicability (IA)	Claims	1-18	YES
	Claims	NONE	NO

2. Citations and explanations:

Claims 1, 3-5, 7, 9-11, 13 and 15-17 lacks novelty under PCT Article 33(2) as being anticipated by US 2012/0170642 A1 to Braness, J et al. (hereinafter "Braness").

As per claim 1, Braness discloses a method of supporting video streaming with trick play, comprising: encoding video into multiple adaptive bitrate streams and a corresponding trick play stream (a method is provided for visual search of media encoded for adaptive bitrate streaming using trick play streams, paragraph [0008]), each of the streams comprising files of encoded video (the EBML file may contain the trick play stream in which visual search of media encoded is with trick play stream, paragraphs [0008], [0023]); storing the files for each stream (Files generated by a source encoder may be stored on an HTTP server for streaming to playback devices, paragraph [0050]); receiving a playlist request for a selected one of the adaptive bitrate streams (the top level index SMIL file (playlist) can be generated when a playback device requests the commencement of playback of the encoded media in which media encoded may be for adaptive bitrate streaming, paragraphs [0008], [0070]); sending a playlist identifying the stored files of the selected stream (each of the alternative portions of encoded video may be written (sending) to a separate container file in which the playback device can use the top level index file to identify the URI for a more appropriate alternative stream (selected stream) paragraphs [0027], [0101]); receiving a playlist request for the trick play stream (the index may enable the playback device to use multiple byte range requests to select portions of the file containing the trick play stream which may be through HTTP server, paragraph [0044]) and sending a playlist identifying the stored files of the trick play stream (the playback device may use the SMIL file (playlist) to identify the portions of the container file (stored files) to download in which the container file contains the trick play stream, paragraphs [0027], [0070]).

As per claim 7, Braness discloses a system for supporting video streaming with trick play, comprising: an encoder to encode video into multiple adaptive bitrate streams and a corresponding trick play stream (a method is provided for visual search of media encoded for adaptive bitrate streaming using trick play streams, paragraph [0008]), each of the streams comprising files of encoded video (the EBML file may contain the trick play stream in which visual search of media encoded is with trick play stream, paragraphs [0008], [0023]); a download server to store the files for each stream (Files generated by a source encoder may be stored on an HTTP server for streaming to playback devices, paragraph [0050]); and a management server to: receive a playlist request for a selected one of the adaptive bitrate streams (the top level index SMIL file (playlist) can be generated when a playback device requests the commencement of playback of the encoded media in which media encoded may be for adaptive bitrate streaming in which a playback device may request the top level index file resident on the server (management server), paragraphs [0008], [0070], [0095]); send a playlist identifying the stored files of the selected stream (each of the alternative portions of encoded video may be written (sending) to a separate container file in which the playback device can use the top level index file to identify the URI for a more appropriate alternative stream (selected stream) paragraphs [0027], [0101]); receive a playlist request for the trick play stream (the index may enable the playback device to use multiple byte range requests to select portions of the file containing the trick play stream which may be through HTTP server, paragraph [0044]); and send a playlist identifying the stored files of the trick play stream (the playback device may use the SMIL file (playlist) to identify the portions of the container file (stored files) to download in which the container file contains the trick play stream, paragraphs [0027], [0070]).

As per claim 13, Braness discloses a non-transitory computer readable medium encoded with a computer program including instructions to cause a processor (processor is provided that is configured by a source encoder application stored in the memory, paragraph [0027]) to: encode video into multiple adaptive bitrate streams (media encoded may be for adaptive bitrate streaming, paragraph [0008]) and a corresponding trick play stream, each of the streams comprising files of encoded video (the index information may enable the playback device to request byte ranges that may correspond to Cluster elements within the Matroska container file that may contain specific portions of encoded media through HTTP from the server, paragraph [0044]); store the files for each stream (Files generated by a source encoder may be stored on an HTTP server for streaming to playback devices, paragraph [0050]); receive a playlist request for a selected one of the adaptive bitrate streams (the top level index SMIL file (playlist) can be generated when a playback device requests the commencement of playback of the encoded media in which media encoded may be for adaptive bitrate streaming, paragraphs [0008], [0070]); send a playlist identifying the stored files of the selected stream (each of the alternative portions of encoded video may be written (sending) to a separate container file in which the playback device can use the top level index file to identify the URI for a more appropriate alternative stream (selected stream) paragraphs [0027], [0101]); receive a playlist request for the trick play stream (the index may enable the playback device to use multiple byte range requests to select portions of the file containing the trick play stream which may be through HTTP server, paragraph [0044]); and send a playlist identifying the stored files of the trick play stream (the playback device may use the SMIL file (playlist) to identify the portions of the container file (stored files) to download in which the container file contains the trick play stream, paragraphs [0027], [0070]).

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/39852

Supplemental Box

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

-***-Continued from Box V: Citations and Explanations-***-
As per claims 3, 9 and 15, Braness discloses the method of claim 1, the system of claim 7 and the computer readable medium of claim 13. Braness further discloses wherein: the files in each stream are associated with successive time codes (the frames of the trick play stream are stored within Cluster elements having time codes corresponding to the Cluster elements of the alternative stream (successive time codes), paragraph [0042]); the playlist request for the selected stream specifies a current time code; and the playlist for the selected stream identifies files in the selected stream that are associated with successive time codes greater than the current time code (a Cluster element has a timecode associated with it, and each subsequent Block element specifies the timecode relative to the Cluster timecode, and the playback request will specify a target Cluster using a CueTime, paragraphs [0075] and [0082]).

As per claims 4, 10 and 16, Braness discloses the method of claim 3, the system of claim 9 and the computer readable medium of claim 15. Braness further discloses wherein: the playlist request for the trick play stream (a playback device requests the top level index file resident on the server and uses the index information to identify the streams that are available to the playback device in which Playback of trick play streams, [0095]) includes a trick play time code that is greater than the current time code; and the trick play playlist identifies files in the trick play stream associated with successively decreasing time codes that are each less than the trick play time code (playback requests indicate a CueTime to start, and a user may reverse direction through a trick play file having timecodes corresponding to the regular play file, paragraphs [0042], [0046], [0074], and [0082]).

As per claim 5, Braness discloses the method of claim 1. Braness further discloses wherein: the encoding includes encoding the video based on a distinct combination of an encoding bitrate and a video frame rate for each stream (the portion of video is encoded in each stream as a single closed group of pictures starting with an IDR frame in which streams that encode the same media content may be in different ways and/or at different bitrates (distinct combination) to enable adaptive bitrate streaming, paragraphs [0042], [0046]); and the encoding bit rate and video frame rate for the trick play stream are less than the encoding bitrates and video frame rates, respectively, for the adaptive bitrate streams (the trick play stream video may be encoded at a lower bitrate, frame rate and a lower resolution that may be with respect to the source video, writing each of the alternative portions of encoded video to a separate container file in which source media may be encoded as a number of alternative streams for adaptive bitrate streaming, paragraphs [0008], [0041], [0042]).

As per claim 11, Braness discloses the system of claim 7. Braness further discloses wherein: the encoder is further configured to encode the video based on a distinct combination of an encoding bitrate and a video frame rate for each stream (the portion of video is encoded in each stream as a single closed group of pictures starting with an IDR frame in which streams that encode the same media content may be in different ways and/or at different bitrates (distinct combination) to enable adaptive bitrate streaming, paragraphs [0042], [0046]); and the encoding bit rate and video frame rate for the trick play stream are less than the encoding bitrates and video frame rates, respectively, for the adaptive bitrate streams (the trick play stream video may be encoded at a lower bitrate, frame rate and a lower resolution that may be with respect to the source video, writing each of the alternative portions of encoded video to a separate container file in which source media may be encoded as a number of alternative streams for adaptive bitrate streaming, paragraphs [0008], [0041], [0042]).

As per claim 17, Braness discloses the computer readable medium of claim 13. Braness further discloses wherein: the instruction to cause the processor to encode include instructions to cause the processor (processor is configured by a source encoder application stored in the memory in which a user instruction is provided to perform a visual search using the trick play stream, paragraphs [0027], [0074]) to encode the video based on a distinct combination of an encoding bitrate and a video frame rate for each stream (the portion of video is encoded in each stream as a single closed group of pictures starting with an IDR frame in which streams that encode the same media content may be in different ways and/or at different bitrates (distinct combination) to enable adaptive bitrate streaming, paragraphs [0042], [0046]); and the encoding bit rate and video frame rate for the trick play stream are less than the encoding bitrates and video frame rates, respectively, for the adaptive bitrate streams (the trick play stream video may be encoded at a lower bitrate, frame rate and a lower resolution that may be with respect to the source video, writing each of the alternative portions of encoded video to a separate container file in which source media may be encoded as a number of alternative streams for adaptive bitrate streaming, paragraphs [0008], [0041], [0042]).

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/39852

Supplemental Box

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

-***-Continued from Previous Supplemental Box-***-
Claims 2, 8 and 14 lack an inventive step under PCT Article 33(3) as being obvious over Braness in view of US 2013/0019273 A1 to Ma, K et al. (hereinafter "Ma").

As per claims 2, 8 and 14, Braness discloses the method of claim 1, the system of claim 7 and the computer readable medium of claim 13. Braness further discloses wherein: the encoded video in the files corresponding to the adaptive bitrate streams comprises encoded video frames (media encoded may be for adaptive bitrate streaming in which encoded video may be written each of alternative portions to a separate container file that uses the source encoder, paragraph [0008]); and the encoded video in the files for the trick play stream (encoded video may be written each of alternative portions to a separate container file that uses the source encoder in which trick play stream may be written to a separate container file, paragraph [0008]). However, Braness fail to disclose including non-key frames each encoded based on video from one or more previous video frames, and key frames interspersed among the non-key frames, each of the key frames encoded independent of previous video frames; comprises key frames without non-key frames. Ma discloses including non-key frames each encoded based on video from one or more previous video frames (fast forward uses bursts of consecutive frames (both key frames and non-key frames) in which the first (D*F/ R) frames of each segment are played out, where F is the frame rate of the encoded video and in which all key frames within the previously parsed segment should be used before proceeding to step 412 that may be to retrieve and parse a new segment, paragraphs [0007], [0031]), and key frames interspersed among the non-key frames, each of the key frames encoded independent of previous video frames; comprises key frames without non-key frames (fast forward uses bursts of consecutive frames (both key frames and non-key frames) (interspersed) in which once the trick play bitrate is selected, processing proceeds to step 214 in which the next segment (independent of previous video frames) is downloaded such that it adheres to the selected trick play bitrate in which the segment is parsed to extract the key frames (without non-key frames) and processing proceeds to step 216, paragraph [0025]). It would have been a matter of obvious experimentation to one of ordinary skill in the art at the time of the invention to modify Braness's invention to include including non-key frames each encoded based on video from one or more previous video frames, and key frames interspersed among the non-key frames, each of the key frames encoded independent of previous video frames; comprises key frames without non-key frames, as taught by Ma, for the benefit of providing a method that includes faster data rate for normal playout using key and non-key frames.

Claims 6, 12 and 18 lack an inventive step under PCT Article 33(3) as being obvious over Braness in view of US 2012/0311094 A1 to Biderman, D et al.(hereinafter " Biderman").

As per claim 6, Braness discloses the method of claim 1. However, Braness fails to disclose wherein: the storing includes storing the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein; and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein. Biderman discloses wherein: the storing includes storing the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein (Multiple media files may be stored on the server in which media files may be retrieved using the URIs (corresponding list of network addresses) for those files in the play list in which Indexer 440 may create files with a listing of an order for identifiers corresponding to each file created by segmenter 430, paragraphs [0052], [0139], [0144]); and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein (a server provides the play list file 1001 that may contain the two different sets of URLs (identifying stored files) that may allow either 1 x playback or fast forward or reverse playback (trick play) in which a play list file may include Uniform Resource Identifiers (URIs) (list of network addresses) that may direct the client to the segmented media files stored on a server, paragraphs [0047], [0167]). It would have been a matter of obvious experimentation to one of ordinary skill in the art at the time of the invention to modify Braness's invention, to include wherein: the storing includes storing the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein; and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein, as taught by Biderman, for the benefit of providing single large file to store media content that can be used by the client for retrieving portion of contents based on the URIs.

As per claim 12, Braness discloses the system of claim 7. However, Braness fails to disclose wherein: the download server is configured to store the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein; and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein. Biderman discloses wherein: the download server is configured to store the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein (Multiple media files may be stored on the server (download server) in which the URIs may identify a location from which a client can download a supplementary media file and in which media files may be retrieved using the URIs (corresponding list of network addresses) for those files in the play list in which Indexer 440 may create files with a listing of an order for identifiers corresponding to each file created by segmenter 430, paragraphs [0052], [0139], [0144]); and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein (a server provides the play list file 1001 that may contain the two different sets of URLs (identifying stored files) that may allow either 1 x playback or fast forward or reverse playback (trick play) in which a play list file may include Uniform Resource Identifiers (URIs) (list of network addresses) that may direct the client to the segmented media files stored on a server, paragraphs [0047], [0167]). It would have been a matter of obvious experimentation to one of ordinary skill in the art at the time of the invention to modify Braness's invention to include wherein: the download server is configured to store the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein; and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein, as taught by Biderman, for the benefit of providing single large file to store media content that can be used by the client for retrieving portion of contents based on the URIs.

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/39852

Supplemental Box

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

-***-Continued from Previous Supplemental Box-***-

As per claim 18, Braness discloses the computer readable medium of claim 13. However, Braness fails to disclose wherein: the instruction to cause the processor to store include instructions to cause the processor to store the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein; and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein. Biderman discloses wherein: the instruction to cause the processor to store include instructions to cause the processor (processor is configured by a source encoder application stored in the memory in which a user instruction is provided to perform a visual search using the trick play stream, paragraphs [0027], [0074]) to store the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein (Multiple media files may be stored on the server (download server) in which the URIs may identify a location from which a client can download a supplementary media file and in which media files may be retrieved using the URIs (corresponding list of network addresses) for those files in the play list in which Indexer 440 may create files with a listing of an order for identifiers corresponding to each file created by segmenter 430, paragraphs [0052], [0139], [0144]); and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein (a server provides the play list file 1001 that may contain the two different sets of URLs (identifying stored files) that may allow either 1 x playback or fast forward or reverse playback (trick play) in which a play list file may include Uniform Resource Identifiers (URIs) (list of network addresses) that may direct the client to the segmented media files stored on a server, paragraphs [0047], [0167]). It would have been a matter of obvious experimentation to one of ordinary skill in the art at the time of the invention to modify Braness's invention to include wherein: the instruction to cause the processor to store include instructions to cause the processor to store the files at corresponding network addresses; the playlist identifying the stored files of the selected stream includes a list of the network addresses of the stored files therein; and the playlist identifying the stored files of the trick play stream includes a list of the network addresses of the stored files therein, as taught by Biderman, for the benefit of providing single large file to store media content that can be used by the client for retrieving portion of contents based on the URIs.

Claim 1-18 have industrial applicability as defined by PCT Article 33(4) because the subject matter 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 01974AB.PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 11/66927	International filing date *(day/month/year)* 22 December 2011 (22.12.2011)	(Earliest) Priority Date *(day/month/year)* 05 January 2011 (05.01.2011)
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 35 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:

ADAPTIVE BITRATE STREAMING OF MEDIA STORED IN MATROSKA CONTAINER FILES USING HYPERTEXT TRANSFER PROTOCOL

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.

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 11/66927

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

Systems and methods for adaptive bitrate streaming of media stored in Matroska container files utilizing Hypertext Transfer Protocol (HTTP) are disclosed. In one embodiment, a processor requests portions of files from a remote server and retrieves top level index data that identifies EBML container files and describes a maximum bitrate of the alternative streams contained within the EBML container files. The top level index data is parsed to obtain information identifying the EBML container files, requests a portion of at least one of the EBML container files that contains the at least one element that specifies the encoding parameters of the stream contained within the EBML container file, and requests portions of a first EBML container file that includes elements that contain portions of encoded video, where the selection is based upon the measured streaming conditions and the description of the bitrate of the alternative stream contained within the top level data.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 11/66927

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 15/16 (2012.01)
USPC - 709/231
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: 709/231

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 709/231 | 709/203 | 375/240.28 | 375/E07.011 | 375/E07.154 (keyword limited - see search terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWEST (PGPB, USPT, USOC, EPAB, JPAB); GOOGLE; Google Scholar
Terms: streaming, video, adaptive, server, network, bit, rate, container, frame, block, parse, http, encode, elements, level, layer, cluster, chunk, matroska, xml, ebml.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2010/0189183 A1 (Gu et al.) 29 July 2010 (29.07.2010), entire document, especially abstract, para [0004], [0006], [0008], [0020], [0022], [0024], [0026], [0042], [0046], [0047], [0068].	1-66
Y	US 2007/0168541 A1 (Gupta et al.) 19 July 2007 (19.07.2007), entire document, especially abstract, para [0003], [0004], [0022], [0023], [0028], [0040], [0047], [0055], [0068], [0080], [0083].	1-66
A	US 2007/0083617 A1 (Chakrabarti et al.) 12 April 2007 (12.04.2007), entire document, especially abstract, para [0007], [0010], [0012], [0014], [0024], [0030], [0061], [0078], [0102].	1-66

☐ 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
03 April 2012 (03.04.2012)	20 APR 2012
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)*	20 APR 2012
Applicant's or agent's file reference 01974AB.PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 11/66927	22 December 2011 (22.12.2011)	05 January 2011 (05.01.2011)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 15/16 (2012.01)
USPC - 709/231

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	03 April 2012 (03.04.2012)	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 11/66927

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:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/66927

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	1-66	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-66	NO
Industrial applicability (IA)	Claims	1-66	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-66 lack an inventive step under PCT Article 33(3) as being obvious over US 2010/0189183 A1 to Gu et al. (hereinafter Gu) in view of US 2007/0168541 A1 to Gupta et al. (hereinafter Gupta).

Regarding claim 1, Gu teaches a playback device configured to perform adaptive bitrate streaming (a multiple bit rate video encoder encodes a plurality of video streams for multiple bit rate video streaming with an objective of providing a more consistent video quality, para [0008]) using a plurality of alternative streams of encoded video packaged within extensible binary markup language (EBML) container files (utilizes the motion information to perform inter-frame coding of the predicted frames of the video content. The encoding can be performed according to a known video encoding standard, such as Windows Media Video format, SMPTE 421-M format, MPEG-x format (e.g., MPEG-1, MPEG-2, or MPEG-4), H.26.times. format (e.g., H.261, H.262, H.263, or H.264), or other format, para [0026]), where each of the plurality of alternative streams is the same source video encoded using different encoding parameters in such a way that each portion of encoded video packed into an element of an EBML container file (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]) commences with an intra frame starting a closed Group of Pictures (GOP) and each of the EBML container files includes at least one element that specifies the encoding parameters of the stream contained within the EBML container file (Video streams at intermediate bit rates are encoded at progressively decreasing variable bit rates (subject to decreasing peak and average bit rate constraints), para [0008]), the playback device comprising: a processor configured, via a client application, to request portions of files from a remote server (a server 110 (e.g., a server computer system such as a standard HTTP server) provides multimedia content to a client 120 (e.g., a client computer system, such as a laptop or desktop computer, or another type of computing device, such as a PDA or mobile phone) via a network, para [0020]); wherein the client application further configures the processor to: retrieve top level index data that identifies a plurality of EBML container files and describes at least a maximum bitrate of the alternative streams contained within the EBML container files (top MBR video stream (generally having highest overall bit rate), the video encoder 200 encodes the video stream with a varying bit rate constrained to fall under a specified peak bit rate while satisfying a specified average bit rate. For the bottom MBR stream (generally having the lowest bit rate of the set), the video encoder uses a constant chunk rate approach. In the context of the multiple bit rate video streaming system, the term chunk refers to a group of pictures (GOP) into which the video stream are segmented, para [0042]); request a portion of at least one of the EBML container files that contains the at least one element that specifies the encoding parameters of the stream contained within the EBML container file (divides video of a multimedia program into multiple streaming segments, and contains a number of compressed bit streams representing the video segments at various bit rates, para [0020]); retrieve an index that references each element containing portions of encoded video within at least one of the EBML container files (the indexed file for multi bit rate streaming can be used by standard HTTP servers to serve multimedia content at multiple bit rates with bit rate selection (rate control) being performed client-side (e.g., exclusively client-side). Clients can perform rate control by first obtaining index information from the server describing the various bit rates available for streaming segments of a program, para [0022]); utilize the index to request portions of a first EBML container file that includes elements that contain portions of encoded video (divided into temporal chunks called streaming segments (self-contained units). The server stores each streaming segment at one or more bit rates (e.g., each streaming segment--bit rate combination is a separate streaming segment encoding). Each streaming segment includes one or more available bit rate encodings for a specific track, para [0024]); receive and buffer the requested elements (Based on the index information, and possibly other information (e.g., network bandwidth, buffer information, etc.), the client can decide which bit rate streaming segments to download from the server to provide a desired user experience, para [0022]); decode the encoded video contained within the buffered elements utilizing the encoding parameters (the video streams at the multiple bit rates can all be decoded and scaled to this same final display resolution in order to achieve a glitch free video presentation, para [0006]). Gu does not expressly teach parse the top level index data to obtain information identifying the plurality of EBML container files; measure current streaming conditions; and select another of the EBML container files from which to retrieve elements containing portions of encoded video for decoding, where the selection is based upon the measured streaming conditions and the description of the bitrate of the alternative stream contained within the top level data. However Gupta, in an analogous art, teaches parse the top level index data to obtain information identifying the plurality of EBML container files (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]); measure current streaming conditions (the server 110 can measure the time between client reads of successive 64 kB chunks of content. This is a reasonable measurement of client 105 throughput because the standard internet networking architecture (routers, switches, etc.) have very small

---continued in supplemental box---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/66927

Supplemental Box

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

Continuation of:
Box No. V.2. Citations and explanations.

Claim 1 (continued): buffers, and thus, the rate at which the client is reading can be estimated in this way. The amount of network buffering may also be able to be determined by keeping statistics and probing each client's destination network or sub-net. Other factors that affect client networking speed (such as the required retransmission of TCP/IP network packets) can be known, measured, and accounted for as well, to give a more accurate estimation of client read speed, para [0080]); and select another of the EBML container files from which to retrieve elements containing portions of encoded video for decoding, where the selection is based upon the measured streaming conditions and the description of the bitrate of the alternative stream contained within the top level data (Once the sending rate is adjusted 1060, the server 110 returns to selecting 1020 the next portion of content, modifying 1030 the content if necessary, and writing 1040 the portion to output. Following the writing 1040 step, the server 110 next determines 1070 whether more instructions apply to the requested media content. If the request includes more instructions, steps 1020-1040 repeat according to the next instruction. Once all instructions are processed and the altered media shot is formed from the selected frames, the server 110 serves 1080 any remaining portion of the combined media shot to the client , para [0083]). It would have been obvious to one skilled in the art to combine the teachings of Gu with those of Gupta in order to more efficiently adapt to multiple streaming bit rates in the video playback system of Gu (see Gupta para [0003]-[0004]).

Regarding claim 2, Gu further teaches wherein: each of the EBML container files comprises a plurality of Cluster elements, where each Cluster element contains a portion of encoded video (term chunk refers to a group of pictures (GOP) into which the video stream are segmented, and define the level of granularity at which the video streaming system may switch playing individual segments between video streams. The constant chunk rate approach enables the video streaming system to guarantee predictability of streaming, para [0042]); and the portion of encoded video in each of the Cluster elements commences with an intra frame and includes at least one closed group of pictures (video encoder then performs intra-frame coding of reference frames of the video content, and utilizes the motion information to perform inter-frame coding of the predicted frames of the video content, para [0026]).

Regarding claim 3, Gu further teaches wherein the portions of encoded video in each of the Cluster elements have the same duration (constant chunk rate approach enables the video streaming system to guarantee predictability of streaming, in that when the lowest bit rate or quality video stream is streamed, the client will receive the chunk amount of pictures at the constant rate so as to maintain minimum quality continuous playing of the video, para [0042]).

Regarding claim 4, Gupta further teaches wherein the portions of encoded video in each of the Cluster elements have a 2 second duration (request also includes a time range for each shot, specified as the starting time (e.g., in seconds into the content) and length (e.g., in seconds). For example, for shot 1, the starting time is 10 seconds (begin=10) and the length is 8 seconds (len=8). The request also includes an edit list that refers to a list of instructions for interleaving the four streams from shots 1-4, such that the new piece of content includes the video of each of shots 1-3 and the audio of shot, para [0055]).

Regarding claim 5, Gu further teaches wherein each Cluster element contains a time code and each encoded frame of the portion of encoded video contained within the Cluster element is contained within a separate BlockGroup element (Between marked boundaries of a video sequence (sequence mark-in and sequence mark-out positions), the MBR encoding process 300 further determines a total number of group of pictures segments in which to divide the video sequence within user-specified constraints (such as a specified average GOP length and maximum allowed GOP length within a scene) and sets boundaries of each group of pictures, para [0046]).

Regarding claim 6, Gu further teaches wherein the first BlockGroup element in the Cluster element contains the intra frame (MBR engine controls the video encoder to produce an encoding of the video stream to meet the constant chunk rate constraint, which helps guarantee client side predictability for playing the streamed video. In intermediate video streams, the MBR engine causes the video encoder to encode the source video with encoding parameters to produce the video stream a variable bit rate falling within maximal peak and average bit rate constraints for the respective intermediate stream, para [0047]).

Regarding claim 7, Gupta further teaches wherein the first BlockGroup element contains a Block element, which specifies the time code attribute of the intra frame relative to the time code of the Cluster element (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks, para [0022]).

Regarding claim 8, Gu further teaches wherein each of the alternative streams of encoded video is encoded at a different maximum bitrate (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]).

Regarding claim 9, Gupta further teaches wherein at least two of the alternative streams of encoded video are encoded at the same display aspect ratio, but with different resolutions using different sample aspect ratios (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 10, Gupta further teaches wherein the at least one element in each of the EBML container files that specifies the encoding parameters of the stream contained within the EBML container file specifies the frame height, frame width and sample aspect ratio of the video stream contained within the EBML container file (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

---continued in supplemental box---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No. PCT/US 11/66927

Supplemental Box

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

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Regarding claim 11, Gupta further teaches wherein the client application configures the processor to set the frame height, frame width, and sample aspect ratio prior to commencing the decoding of encoded video contained within buffered elements from one of the EBML container files (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 12, Gu further teaches wherein at least two of the alternative streams of encoded video are encoded at different frame rates (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]).

Regarding claim 13, Gupta further teaches wherein the at least one element in each of the EBML container files that specifies the encoding parameters of the stream contained within the EBML container file specifies the frame rate of the video stream contained within the EBML container file (In addition, the server 110 stores the relevant header and footer information, such as video resolution and frame rate, byte range of the portion of the file that is being composed, and other file format specific information, para [0040]).

Regarding claim 14, Gupta further teaches wherein the client application configures the processor to set the frame rate prior to commencing the decoding of encoded video contained within buffered elements from one of the EBML container files (In addition, the server 110 stores the relevant header and footer information, such as video resolution and frame rate, byte range of the portion of the file that is being composed, and other file format specific information, para [0040]).

Regarding claim 15, Gu further teaches wherein the client application configures the playback device to request portions of files from remote servers via Hypertext Transfer Protocol (HTTP) byte range requests (the indexed file for multi bit rate streaming can be used by standard HTTP servers to serve multimedia content at multiple bit rates with bit rate selection (rate control) being performed client-side (e.g , exclusively client-side). Clients can perform rate control by first obtaining index information from the server describing the various bit rates available for streaming segments of a program, para [0022]).

Regarding claim 16, Gupta further teaches wherein the top level index data is SMIL data and the information that identifies the plurality of EBML container files is a plurality of Universal Resource Indicators that identify the location of each of the EBML container files (instructions are converted into a request from the client for the edited content, for example in the form of a URL as described in conjunction with FIGS. 4A-C, which is sent to the server, para [0068]).

Regarding claim 17, Gu further teaches wherein the SMIL data specifies the maximum bitrate of the encoded stream contained within the EBML container file identified by each of the URLs (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]).

Regarding claim 18, Gupta further teaches wherein: the index that references each of the elements containing portions of the encoded stream within the EBML container file is located within at least one element of the EBML container file (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]); the SMIL file specifies the portions of the EBML container file that contain the elements that contain the encoding parameters (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]); the client application further configures the processor to: parse the SMIL file to identify the portions of the EBML container file that contain the elements that contain the encoding parameters; and request the portions of the EBML container file that contain the elements that contain the encoding parameters (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]).

Regarding claim 19, Gupta further teaches wherein: each EBML container file includes at least one element containing an index that references each element containing portions of encoded video within the EBML container file; and the client application configures the processor to retrieve the index that references each element containing portions of encoded video within an EBML container file by requesting the portion of the EBML container file that includes the at least one element containing the index (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]).

Regarding claim 20, Gupta further teaches wherein the index is located within a Cues element within the EBML container file (computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index 130, which can be queried using a content identifier, para [0022]).

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Regarding claim 21, Gupta further teaches wherein the Cues element includes a plurality of CuePoint elements that include a time attribute and point to the location of each element containing a portion of encoded video within the EBML file (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]).

Regarding claim 22, Gupta further teaches wherein the client application configures the processor to: search for the location of an element containing a specific portion of encoded video within the EBML file using the time attributes of the CuePoint elements within the index; and request a portion of the EBML file including at least the element identified using the CuePoint elements (computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index 130, which can be queried using a content identifier, para [0022]).

Regarding claim 23, Gupta further teaches wherein the encoding parameters utilized to decode the encoded video include at least one encoding parameter selected from the group consisting of frame rate, frame height, frame width, sample aspect ratio, maximum bitrate, and minimum buffer size (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 24, Gupta further teaches wherein the client application configures the processor to measure the current streaming conditions by measuring the time taken to receive requested elements from the time at which the elements were requested (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]).

Regarding claim 25, Gu further teaches wherein: the client application configures the processor to initially request a portion of a first EBML container file containing at least one element that specifies the encoding parameters of the stream contained within the first EBML container file (a server 110 (e.g., a server computer system such as a standard HTTP server) provides multimedia content to a client 120 (e.g., a client computer system, such as a laptop or desktop computer, or another type of computing device, such as a PDA or mobile phone) via a network, para [0020]); and the client application further configures the processor to request a portion of a second EBML container file containing at least one element that specifies the encoding parameters of the stream contained within the second EBML container file, when the client application selects to retrieve elements containing portions of encoded video for decoding from the second EBML container file based upon the measured streaming conditions and the description of the bitrate of the alternative stream contained within the top level index (divides video of a multimedia program into multiple streaming segments, and contains a number of compressed bit streams representing the video segments at various bit rates, para [0020]).

Regarding claim 26, Gu further teaches wherein the playback device is further configured to perform adaptive bitrate streaming using an EBML container file that contains a trick play track (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 27, Gu further teaches wherein the client application configures the processor to select the EBML container file containing the trick play track as the EBML container file from which to retrieve elements containing portions of encoded video in response to a user instruction (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 28, Gu further teaches wherein the playback device is further configured to perform adaptive streaming using at least one EBML container file containing a track of encoded audio (a multiple bit rate video encoder encodes a plurality of video streams for multiple bit rate video streaming with an objective of providing a more consistent video quality, para [0008]).

Regarding claim 29, Gu further teaches wherein the client application configures the processor to retrieve and decode encoded audio from one of the at least one EBML container files containing an audio track and to synchronize the decoded audio with the decoded video (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

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Regarding claim 30, Gu further teaches wherein each of the EBML container files includes elements containing at least one track of encoded audio multiplexed with the encoded video (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 31, Gu further teaches wherein the client application is configured to: retrieve portions of the EBML file containing elements that include portions of one of the tracks of encoded audio (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]); decode the retrieved encoded audio; and synchronize the decoded audio and the decoded video (For audio, the input device(s) 650 may be a sound card or similar device that accepts audio input in analog or digital form, or a CD-ROM reader that provides audio samples to the computing environment, para [0068]).

Regarding claim 32, Gu further teaches wherein the playback device is further configured to perform adaptive streaming using at least one EBML container file containing a subtitle track (a multiple bit rate video encoder encodes a plurality of video streams for multiple bit rate video streaming with an objective of providing a more consistent video quality, para [0008]).

Regarding claim 33, Gupta further teaches wherein the client application configures the processor to: subtitle track; retrieve subtitles from one of the at least one EBML container files containing a synchronize the subtitle with the decoded video (This process ensures that the total duration of video and audio content is identical in each stream. Another example of data interleaving is mixing a text or metadata stream, e.g., closed captioning or promotional data, with an existing audio and/or video stream, para [0047]); and overlay the subtitle over the decoded video (may include other data associated with the video content such as program guide information, metadata, and closed captioning text, para [0023]).

Regarding claim 34, Gupta further teaches wherein each of the EBML container files includes elements containing at least one subtitle track multiplexed with the encoded video (This process ensures that the total duration of video and audio content is identical in each stream. Another example of data interleaving is mixing a text or metadata stream, e.g., closed captioning or promotional data, with an existing audio and/or video stream, para [0047]).

Regarding claim 35, Gupta further teaches wherein the client application is configured to: retrieve portions of the EBML file containing elements that include portions of one of the subtitle tracks (This process ensures that the total duration of video and audio content is identical in each stream. Another example of data interleaving is mixing a text or metadata stream, e.g., closed captioning or promotional data, with an existing audio and/or video stream, para [0047]); synchronize the subtitles with the decoded video; and overlay the subtitles on the decoded video (may include other data associated with the video content such as program guide information, metadata, and closed captioning text, para [0023]).

Regarding claim 36, Gu teaches a method of performing adaptive bitrate streaming of media on a playback device (a multiple bit rate video encoder encodes a plurality of video streams for multiple bit rate video streaming with an objective of providing a more consistent video quality, para [0008]) using a plurality of alternative streams of encoded video packaged within extensible binary markup language (EBML) container files (utilizes the motion information to perform inter-frame coding of the predicted frames of the video content. The encoding can be performed according to a known video encoding standard, such as Windows Media Video format, SMPTE 421-M format, MPEG-x format (e.g., MPEG-1, MPEG-2, or MPEG-4), H.26.times. format (e.g., H.261, H.262, H.263, or H.264), or other format, para [0026]), where each of the alternative streams of video is the same source video encoded using different encoding parameters in such a way that each portion of encoded video packed into an element of an EBML container file (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]) commences with an intra frame starting a closed Group of Pictures (GOP) and each of the EBML container files includes at least one element that specifies the encoding parameters of the stream contained within the EBML container file (Video streams at intermediate bit rates are encoded at progressively decreasing variable bit rates (subject to decreasing peak and average bit rate constraints), para [0008]), the method comprising: retrieving top level index data that identifies each of the plurality of EBML container files and describes at least the maximum bitrate of each of the alternative streams contained within the EBML container files (generally having highest overall bit rate), the video encoder 200 encodes the video stream with a varying bit rate constrained to fall under a specified peak bit rate while satisfying a specified average bit rate. For the bottom MBR stream (generally having the lowest bit rate of the set), the video encoder uses a constant chunk rate approach. In the context of the multiple bit rate video streaming system, the term chunk refers to a group of pictures (GOP) into which the video stream are segmented, para [0042]); requesting a portion of at least one of the EBML container files that contains the at least one element that specifies the encoding parameters of the stream contained within the EBML container file (divides video of a multimedia program into multiple streaming segments, and contains a number of compressed bit streams representing the video segments at various bit rates, para [0020]); retrieving an index that references each element containing portions of encoded video within at least one of the EBML container files (the indexed file for multi bit rate streaming can be used by standard HTTP servers to serve multimedia content at multiple bit rates with bit rate selection (rate control) being performed client-side (e.g., exclusively client-side). Clients can perform rate control by first obtaining index information from the server describing the various bit rates available for streaming segments of a program, para [0022]); utilizing the index to request portions of a first EBML container file that includes elements that contain portions of encoded video (divided into temporal chunks called streaming segments (self-contained units). The server stores each

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Claim 36 (continued): streaming segment at one or more bit rates (e.g., each streaming segment--bit rate combination is a separate streaming segment encoding). Each streaming segment includes one or more available bit rate encodings for a specific track, para [0024]); receiving and buffering the requested elements (Based on the index information, and possibly other information (e.g., network bandwidth, buffer information, etc.), the client can decide which bit rate streaming segments to download from the server to provide a desired user experience, para [0022]); decoding the encoded video contained within the buffered elements utilizing the encoding parameters (the video streams at the multiple bit rates can all be decoded and scaled to this same final display resolution in order to achieve a glitch free video presentation, para [0006]). Gu does not expressly teach parsing the top level index data to obtain information identifying the plurality of EBML container files; measuring current streaming conditions; and selecting another of the EBML container files from which to retrieve elements containing portions of encoded video for decoding, where the selection is based upon the measured streaming conditions and the description of the bitrate of the alternative stream contained within the top level index data. However Gupta, in an analogous art, teaches parsing the top level index data to obtain information identifying the plurality of EBML container files (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]); measuring current streaming conditions (the server 110 can measure the time between client reads of successive 64 kB chunks of content. This is a reasonable measurement of client 105 throughput because the standard internet networking architecture (routers, switches, etc.) have very small buffers, and thus, the rate at which the client is reading can be estimated in this way. The amount of network buffering may also be able to be determined by keeping statistics and probing each client's destination network or sub-net. Other factors that affect client networking speed (such as the required retransmission of TCP/IP network packets) can be known, measured, and accounted for as well, to give a more accurate estimation of client read speed, para [0080]); and selecting another of the EBML container files from which to retrieve elements containing portions of encoded video for decoding, where the selection is based upon the measured streaming conditions and the description of the bitrate of the alternative stream contained within the top level index data (Once the sending rate is adjusted 1060, the server 110 returns to selecting 1020 the next portion of content, modifying 1030 the content if necessary, and writing 1040 the portion to output. Following the writing 1040 step, the server 110 next determines 1070 whether more instructions apply to the requested media content. If the request includes more instructions, steps 1020-1040 repeat according to the next instruction. Once all instructions are processed and the altered media shot is formed from the selected frames, the server 110 serves 1080 any remaining portion of the combined media shot to the client , para [0083]). It would have been obvious to one skilled in the art to combine the teachings of Gu with those of Gupta in order to more efficiently adapt to multiple streaming bit rates in the video playback system of Gu (see Gupta para [0003]-[0004]).

Regarding claim 37, Gu teaches a source encoder configured to encode source video (a multiple bit rate video encoder encodes a plurality of video streams for multiple bit rate video streaming with an objective of providing a more consistent video quality, para [0008]) as a plurality of alternative video streams packed in container files , where the container files are extensible binary markup language (EBML) files, the source encoder comprising:a processor configured via a source encoding application to ingest at least one multimedia file containing a source video (utilizes the motion information to perform inter-frame coding of the predicted frames of the video content. The encoding can be performed according to a known video encoding standard, such as Windows Media Video format, SMPTE 421-M format, MPEG-x format (e.g., MPEG-1, MPEG-2, or MPEG-4), H.26.times. format (e.g., H.261, H.262, H.263, or H.264), or other format, para [0026]); wherein the source encoding application further configures the processor to: select a portion of the source video (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]); transcode the selected portion of the source video into a plurality of alternative portions of encoded video, where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame starting a closed Group of Pictures (GOP) (Video streams at intermediate bit rates are encoded at progressively decreasing variable bit rates (subject to decreasing peak and average bit rate constraints), para [0008]); write each of the alternative portions of encoded video to an element of a different EBML container file, where each element is located within an EBML container file that also includes another element that indicates the encoding parameters used to encode the alternative portion of encoded video (a server 110 (e.g., a server computer system such as a standard HTTP server) provides multimedia content to a client 120 (e.g., a client computer system, such as a laptop or desktop computer, or another type of computing device, such as a PDA or mobile phone) via a network, para [0020]). Gu does not expressly teach add an entry to at least one index that identifies the location of the element containing one of the alternative portions of encoded video within each of the EBML container files. However Gupta, in an analogous art, teaches add an entry to at least one index that identifies the location of the element containing one of the alternative portions of encoded video within each of the EBML container files (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]). It would have been obvious to one skilled in the art to combine the teachings of Gu with those of Gupta in order to more efficiently adapt to multiple streaming bit rates in the video playback system of Gu (see Gupta para [0003]-[0004]).

Regarding claim 38, Gu further teaches wherein transcoding a selected portion of the source video further comprises transcoding the selected portion into at least one closed group of pictures (term chunk refers to a group of pictures (GOP) into which the video stream are segmented, and define the level of granularity at which the video streaming system may switch playing individual segments between video streams. The constant chunk rate approach enables the video streaming system to guarantee predictability of streaming, para [0042]);

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Claim 38 (continued): and the portion of encoded video in each of the Cluster elements commences with an intra frame and includes at least one closed group of pictures (video encoder then performs intra-frame coding of reference frames of the video content, and utilizes the motion information to perform inter-frame coding of the predicted frames of the video content, para [0026]).

Regarding claim 39, Gu further teaches wherein the portion of source video is selected based upon the duration of the selected portion of source video (constant chunk rate approach enables the video streaming system to guarantee predictability of streaming, in that when the lowest bit rate or quality video stream is streamed, the client will receive the chunk amount of pictures at the constant rate so as to maintain minimum quality continuous playing of the video, para [0042]).

Regarding claim 40, Gupta further teaches wherein the source encoding application configures the processor to select a portion of the source video having a duration of two seconds (request also includes a time range for each shot, specified as the starting time (e.g., in seconds into the content) and length (e.g., in seconds). For example, for shot 1, the starting time is 10 seconds (begin=10) and the length is 8 seconds (len=8). The request also includes an edit list that refers to a list of instructions for interleaving the four streams from shots 1-4, such that the new piece of content includes the video of each of shots 1-3 and the audio of shot, para [0055]).

Regarding claim 41, Gu further teaches wherein each of the alternative portions of encoded video is encoded with a different maximum bitrate (MBR engine controls the video encoder to produce an encoding of the video stream to meet the constant chunk rate constraint, which helps guarantee client side predictability for playing the streamed video. In intermediate video streams, the MBR engine causes the video encoder to encode the source video with encoding parameters to produce the video stream a variable bit rate falling within maximal peak and average bit rate constraints for the respective intermediate stream, para [0047]).

Regarding claim 42, Gupta further teaches wherein at least two of the alternative portions of encoded video are encoded with different resolutions (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 43, Gupta further teaches wherein at least two of the alternative portions of encoded video are encoded with different frame rates (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 44, Gupta further teaches wherein the element of the EBML container file to which each alternative portion of encoded video is written is a Cluster element containing a time code and the portion of encoded video is contained within BlockGroup elements within the Cluster element (In addition, the server 110 stores the relevant header and footer information, such as video resolution and frame rate, byte range of the portion of the file that is being composed, and other file format specific information, para [0040]).

Regarding claim 45, Gu further teaches wherein each encoded frame of the alternative portion of encoded video contained within the Cluster element is contained within a separate BlockGroup element (Between marked boundaries of a video sequence (sequence mark-in and sequence mark-out positions), the MBR encoding process 300 further determines a total number of group of pictures segments in which to divide the video sequence within user-specified constraints (such as a specified average GOP length and maximum allowed GOP length within a scene) and sets boundaries of each group of pictures, para [0046]).

Regarding claim 46, Gu further teaches wherein the first BlockGroup element in the Cluster element contains the IDR frame (MBR engine controls the video encoder to produce an encoding of the video stream to meet the constant chunk rate constraint, which helps guarantee client side predictability for playing the streamed video. In intermediate video streams, the MBR engine causes the video encoder to encode the source video with encoding parameters to produce the video stream a variable bit rate falling within maximal peak and average bit rate constraints for the respective intermediate stream, para [0047]).

Regarding claim 47, Gupta further teaches wherein the first BlockGroup element contains a Block element, which specifies the time code attribute of the IDR frame relative to the time code of the Cluster element (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks, para [0022]).

Regarding claim 48, Gupta further teaches wherein each element to which each of the alternative portions of encoded video is written is assigned the same time code (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks, para [0022]).

Regarding claim 49, Gupta further teaches wherein the source encoding application further configures the processor to create an index for each of the EBML container files (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 50, Gupta further teaches wherein the source encoding application further configures the processor to add the location of the element containing one of the alternative portions of encoded video within each of the EBML container files to the index for the EBML container file (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

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Regarding claim 51, Gupta further teaches wherein the source encoding application further configures the processor to pack the index for each EBML container file into the EBML container file (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 52, Gupta further teaches wherein each index comprises a Cues element (computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index 130, which can be queried using a content identifier, para [0022]).

Regarding claim 53, Gupta further teaches wherein each Cues element includes a CuePoint element that points to the location of the element containing one of the alternative portions of encoded video within the EBML file (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]).

Regarding claim 54, Gupta further teaches wherein the source encoding application further configures the processor to create a top level index file that identifies each of the EBML container files (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 55, Gu further teaches wherein the ingested multimedia file also includes source audio (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 56, Gu further teaches wherein the source encoding application configures the processor to multiplex the audio into each of the EBML container files (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 57, Gu further teaches wherein the source encoding application configures the processor to write the audio to a separate EBML container file (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 58, Gu further teaches wherein the source encoding application further configures the processor to transcode at least one of the at least one audio tracks (Video streams at intermediate bit rates are encoded at progressively decreasing variable bit rates (subject to decreasing peak and average bit rate constraints), para [0008]).

Regarding claim 59, Gupta further teaches wherein the ingested multimedia file further comprises subtitles (This process ensures that the total duration of video and audio content is identical in each stream. Another example of data interleaving is mixing a text or metadata stream, e.g., closed captioning or promotional data, with an existing audio and/or video stream, para [0047]).

Regarding claim 60, Gupta further teaches wherein the source encoding application configures the processor to multiplex the subtitles into each of the EBML container files (This process ensures that the total duration of video and audio content is identical in each stream. Another example of data interleaving is mixing a text or metadata stream, e.g., closed captioning or promotional data, with an existing audio and/or video stream, para [0047]).

Regarding claim 61, Gupta further teaches wherein the source encoding application configures the processor to write the subtitles to a separate EBML container file (This process ensures that the total duration of video and audio content is identical in each stream. Another example of data interleaving is mixing a text or metadata stream, e.g., closed captioning or promotional data, with an existing audio and/or video stream, para [0047]).

Regarding claim 62, Gu further teaches wherein the source encoding application further configures the processor to transcode the source video to create a lower frame rate trick play track and to write the trick play track to a separate EBML container file (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

---continued in supplemental box---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/66927

Supplemental Box

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

Continuation of:
Box No. V.2. Citations and explanations.

Regarding claim 63, Gu further teaches wherein the trick play track is also lower resolution than the source video (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 64, Gu further teaches wherein the source encoding application further configures the processor to write the element containing a set of encoding parameters in each of the EBML container files (Each streaming segment includes one or more available bit rate encodings for a specific track (e.g., a specific audio track, such as an English audio track, or a specific video track) of a program. Clients then determine which bit rate, from the available bit rates (e.g., from the available streaming segment encodings), to download for each streaming segment. For example, a client may obtain a first streaming segment, for a video track, encoded at 250 Kb/sec (kilo-bits per second) (from one or more available streaming segment encodings for the first streaming segment), para [0024]).

Regarding claim 65, Gupta further teaches wherein the set of encoding parameters includes at least one parameter selected from the group consisting of frame rate, frame height, frame width, sample aspect ratio, maximum bitrate, and minimum buffer size (an identifier for the video encoding format and resolution. In this example, the row identifier includes multiple columns to specify the content index 130 data as discussed herein. Alternatively, all data for all chunks of a media file is stored in a single database row, using one or more columns, para [0028]).

Regarding claim 66, Gu teaches a method of encoding source video as a plurality of alternative streams packed in extensible binary markup language (EBML) files using a source encoder (utilizes the motion information to perform inter-frame coding of the predicted frames of the video content. The encoding can be performed according to a known video encoding standard, such as Windows Media Video format, SMPTE 421-M format, MPEG-x format (e.g., MPEG-1, MPEG-2, or MPEG-4), H.26.times. format (e.g., H.261, H.262, H.263, or H.264), or other format, para [0026]), the method comprising: repeatedly selecting a portion of the source video using the source encoder (source video content is encoded into alternative bit streams at different coding rates and typically stored in the same media file at the server. This then allows the content to be streamed in segments or chunks at varying levels of quality corresponding to different coding rates according to the changing network conditions, para [0004]); transcoding the selected portion of the source video into a plurality of alternative portions of encoded video using the source encoder, where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame starting a closed Group of Pictures (GOP) (Video streams at intermediate bit rates are encoded at progressively decreasing variable bit rates (subject to decreasing peak and average bit rate constraints), para [0008]); writing each of the alternative portions of encoded video to an element of a different EBML container file using the source encoder, where each element is located within an EBML container file that also includes another element containing a set of encoding parameters corresponding to the encoding parameters used to encode the portion of video (a server 110 (e.g., a server computer system such as a standard HTTP server) provides multimedia content to a client 120 (e.g., a client computer system, such as a laptop or desktop computer, or another type of computing device, such as a PDA or mobile phone) via a network, para [0020]). Gu does not expressly teach adding an entry to at least one index that identifies the location of the element containing one of the alternative portions of encoded video within each of the EBML container files. However Gupta, in an analogous art, teaches adding an entry to at least one index that identifies the location of the element containing one of the alternative portions of encoded video within each of the EBML container files (enumerating and assigning each frame a timestamp, parsing the media file headers and footers, and computing format-specific "chunk" boundary points based on the indexable file portions, or chunks. The media content is stored in a source file data storage 125, and data about the media content is stored out-of-band from the media content in a content index, para [0022]). It would have been obvious to one skilled in the art to combine the teachings of Gu with those of Gupta in order to more efficiently adapt to multiple streaming bit rates in the video playback system of Gu (see Gupta para [0003]-[0004]).

Claims 1-66 have industrial applicability as defined by PCT Article 33(4) because the subject matter 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 02353AB.PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2011/067167	International filing date *(day/month/year)* 23 December 2011	(Earliest) Priority Date *(day/month/year)* 05 January 2011
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 4 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.

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/067167

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See Extra Sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-28

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0322
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/067167

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06T 11/00 (2012.01)
USPC - 345/471
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)
IPC(8) - G06T 11/00; H04N 5/228, 5/262, 7/00 (2012.01)
USPC - 345/467, 471; 348/222.1, 239, 468

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
MicroPatent, Google Scholar

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2009/0303241 A1 (PRIYADARSHI et al) 10 December 2009 (10.12.2009) entire document	1-25
Y	WO 2010/060106 A1 (KOHLI et al) 27 May 2010 (27.05.2010) entire document	1-25
Y	US 2009/0132599 A1 (SOROUSHIAN et al) 21 May 2009 (21.05.2009) entire document	18-23
A	US 2009/0307258 A1 (PRIYADARSHI et al) 10 December 2009 (10.12.2009) entire document	1-25

☐ 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 June 2012	02 JUL 2012
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: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/067167

Continuation of Box III.

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 fees must be paid.

Group I, claims 1-25, drawn to a method of playing back encoded media and a playback device, comprising requesting and buffering portions of video from at least one of alternative streams using a playback device; requesting information indicative of a font utilized by a font-rendering engine to render text from a selected subtitle stream; device; downloading at least one font file when the font is not present on the playback requesting and buffering at least a portion of the selected subtitle stream; decoding the buffered portions of video using a decoder on the playback device; rendering the portions of the subtitle stream corresponding to the buffered portion of video using a font-rendering engine configured by the at least one downloaded font file; and performing synchronized playback of the decoded video and rendered subtitles using the playback device.

Group II, claims 26-43, drawn to method of encoding source media and a source encoder, comprising: selecting a portion of the source media using a source encoder; transcoding the selected portion of the source media into a plurality of alternative portions of encoded video using the source encoder, where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame at the start of a closed group of pictures (GOP); writing each of the alternative portions of encoded video to a separate container file using the source encoder; writing a subtitle stream segment from each subtitle track corresponding to the selected portion of the source media to a separate container file using the source encoder; and associating a font file with at least one of the container files containing subtitle stream segments.

The inventions listed as Groups I-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 feature of the Group I invention: requesting and buffering portions of video from at least one of alternative streams using a playback device; requesting information indicative of a font utilized by a font-rendering engine to render text from a selected subtitle stream; device; downloading at least one font file when the font is not present on the playback requesting and buffering at least a portion of the selected subtitle stream; decoding the buffered portions of video using a decoder on the playback device; rendering the portions of the subtitle stream corresponding to the buffered portion of video using a font-rendering engine configured by the at least one downloaded font file; and performing synchronized playback of the decoded video and rendered subtitles using the playback device as claimed therein is not present in the invention of Group II. The special technical feature of the Group II invention: selecting a portion of the source media using a source encoder; transcoding the selected portion of the source media into a plurality of alternative portions of encoded video using the source encoder, where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame at the start of a closed group of pictures (GOP); writing each of the alternative portions of encoded video to a separate container file using the source encoder; writing a subtitle stream segment from each subtitle track corresponding to the selected portion of the source media to a separate container file using the source encoder; and associating a font file with at least one of the container files containing subtitle stream segments as claimed therein is not present in the invention of Groups I.

Groups I and II lack unity of invention because even though the inventions of these groups require the technical feature of encoding media including at least one subtitle track, where the media is encoded as a plurality of alternative video streams and at least one subtitle stream, using a source encoder, this technical feature is not a special technical feature as it does not make a contribution over the prior art in view of US 2009/0307258 A1 (PRIYARDARSHI et al) 10 December 2009 (10.12.2009) paragraphs [0021], [0048], [0067], [0069], claim 20.

Since none of the special technical features of the Group I or II inventions are found in more than one of the inventions, unity of invention is lacking.

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

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DAVID 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)*	02 JUL 2012
Applicant's or agent's file reference 02353A8.PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2011/067167	23 December 2011	05 January 2011

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06T 11/00 (2012.01)
USPC - 345/471

Applicant DIVX, LLC.

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.

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 June 2012	Blaine R. Copenheaver 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/US2011/067167

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:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/067167

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:

   ☐ paid additional fees

   ☐ paid additional fees under protest and, where applicable, the protest fee

   ☐ paid additional fees under protest but the applicable protest fee was not paid

   ☒ not paid additional fees

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

   ☐ complied with

   ☒ not complied with for the following reasons:

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 fees must be paid.

Group I, claims 1-25, drawn to a method of playing back encoded media and a playback device, comprising requesting and buffering portions of video from at least one of alternative streams using a playback device; requesting information indicative of a font utilized by a font-rendering engine to render text from a selected subtitle stream; device; downloading at least one font file when the font is not present on the playback requesting and buffering at least a portion of the selected subtitle stream; decoding the buffered portions of video using a decoder on the playback device; rendering the portions of the subtitle stream corresponding to the buffered portion of video using a font-rendering engine configured by the at least one downloaded font file; and performing synchronized playback of the decoded video and rendered subtitles using the playback device.

Group II, claims 26-43, drawn to method of encoding source media and a source encoder, comprising: selecting a portion of the source media using a source encoder; transcoding the selected portion of the source media into a plurality of alternative portions of encoded video using the source encoder, where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame at the start of a closed group of pictures (GOP); writing each of the alternative portions of encoded video to a separate container file using the source encoder; writing a subtitle stream segment from each subtitle track corresponding to the selected portion of the source media to a separate container file using the source encoder; and associating a font file with at least one of the container files containing subtitle stream segments.

The inventions listed as Groups I-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 feature of the Group I invention: requesting and buffering portions of video from at least one of alternative streams using a playback device; requesting information indicative of a font utilized by a font-rendering engine to render text from a selected subtitle stream; device; downloading at least one font file when the font is not present on the playback requesting and buffering at least a portion of the selected subtitle stream; decoding the buffered portions of video using a decoder on the playback device; rendering the portions of the subtitle stream corresponding to the buffered portion of video using a font-rendering engine configured by the at least one downloaded font file; and performing synchronized playback of the decoded video and rendered subtitles using the playback device as claimed therein is not present in the invention of Group II. The special technical feature of the Group II invention: selecting a portion of the source media using a source encoder; transcoding the selected portion of the source media into a plurality of alternative portions of encoded video using the source encoder, where each alternative portion is encoded using a different set of encoding parameters and commences with an intra frame at the start of a closed group of pictures (GOP); writing each of the alternative portions of encoded video to a separate container file using the source encoder; writing a subtitle stream segment from each subtitle track corresponding to the selected portion of the source media to a separate container file using the source encoder; and associating a font file with at least one of the container files containing subtitle stream segments as claimed therein is not present in the invention of Groups I.

Groups I and II lack unity of invention because even though the inventions of these groups require the technical feature of encoding media including at least one subtitle track, where the media is encoded as a plurality of alternative video streams and at least one subtitle stream, using a source encoder, this technical feature is not a special technical feature as it does not make a contribution over the prior art in view of US 2009/0307258 A1 (PRIYARDARSHI et al) 10 December 2009 (10.12.2009) paragraphs [0021], [0048], [0067], [0069], claim 20.

Since none of the special technical features of the Group I or II inventions are found in more than one of the inventions, unity of invention is lacking.

4. Consequently, this opinion has been established in respect of the following parts of the international application:

   ☐ all parts

   ☒ the parts relating to claims Nos. 1-25

Form PCT/ISA/237 (Box No. IV) (July 2011)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/067167

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	1-25	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-25	NO
Industrial applicability (IA)	Claims	1-25	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-17 and 24-25 lack an inventive step under PCT Article 33(3) as being obvious over Priyadarshi et al. (US 2009/0303241 A1; hereinafter Priyadarshi) in view of Kohli et al. (WO 2010/060106 A1; hereinafter Kohli).

Regarding claim 1, Priyadarshi discloses a method of playing back encoded media (Fig. 1 and Paragraphs [0006], [0027] and [0030]; the invention is to a playback system that displays multimedia files with rendered font and text subtitles that match the video file. The multimedia presentation is analyzed by an encoder/decoder to determine the unique character for each movie/video), where the media is encoded as a stream and at least one subtitle stream (Fig. 6, Paragraphs [0027], [0030] and [0036]; the stream of data includes encoded movie stream data and subtitle information that corresponds to the movie data. With the subtitle information being several font files (31, 32, 33) that correspond to the over time stream of video data), the method comprising: requesting and buffering portions of video from at least one stream using a playback device (Fig. 4 and Paragraph [0031]; video textual elements are sent to a character buffer for playback processing); requesting information indicative of a font utilized by a font-rendering engine to render text from a selected subtitle stream (Fig. 6 and Paragraphs [0021], [0026]-[0027] and [0036]; font files are used by a rendering module (*font-rendering engine*) to render the text or characters displayed with the movie stream); downloading at least one font file when the font is not present on the playback device (Paragraphs [0020], [0035] and [0038]; the necessary font files can be downloaded as an attachment); requesting and buffering at least a portion of the selected subtitle stream (Fig. 4 and Paragraph [0031]; video textual elements are sent to a character buffer for playback processing); decoding the buffered portions of video using a decoder on the playback device (Paragraphs [0030]-[0031] and [0033]; the buffered portions can be sent to a decoder for decoding of the text, audio and video portions); rendering the portions of the subtitle stream corresponding to the buffered portion of video using a font-rendering engine configured by the at least one downloaded font file (Fig. 6 and Paragraphs [0021], [0026]-[0027] and [0036]; font files are used by a rendering module (font-rendering engine) to render the text or characters displayed with the movie stream); and performing synchronized playback of the decoded video and rendered subtitles using the playback device (Fig. 6 and Paragraph [0036]; using start and end time code values the font files (31, 32, 33) are associated (synchronized) with their corresponding decoded video presentation timeline segments). Priyadarshi does not disclose wherein the streams are a plurality of alternative streams. However in disclosing a system of streaming media content (Abstract), Kohli teaches wherein the streams are a plurality of alternative streams (Figs. 1 and 5 and Paragraphs [0027], [0030] and [0162]; multiple media flow directors (alternative streams) can be used to deliver and stream media content to a user device). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the streams are a plurality of alternative streams in the invention of Priyadarshi as taught by Kohli, so the multiple media flow directors can be used to efficiently deliver the media content to a user (Kohli; Paragraph [0162]).

Regarding claim 2, Priyadarshi discloses the method of claim 1, but Priyadarshi does not disclose measuring the current streaming conditions by measuring the time taken to receive requested portions of a stream from the time at which the portions were requested. Kohli teaches measuring the current streaming conditions by measuring the time taken to receive requested portions of a stream from the time at which the portions were requested (Paragraph [0160]; the system measures the delays from streaming to displaying the video and sets the buffer at a setting that covers for these delays). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include measuring the current streaming conditions by measuring the time taken to receive requested portions of a stream from the time at which the portions were requested in the invention of Priyadarshi as taught by Kohli, so the delays can be covered (Kohli; Paragraph [0160]).

Regarding claim 3, Priyadarshi discloses the method of claim 2, but Priyadarshi does not disclose wherein requesting and buffering portions of video from at least one of the alternative streams using a playback device further comprises requesting and buffering portions of video from at least one of the alternative streams based upon the bitrates of the alternative streams and the measured streaming conditions using a playback device. Kohli teaches wherein requesting and buffering portions of video from at least one of the alternative streams using a playback device further comprises requesting and buffering portions of video from at least one of the alternative streams based upon the bitrates of the alternative streams and the measured streaming conditions using a playback device (Paragraphs [0142], [0159]-[0160]; the requested stream can be video from a server at a particular bit rate that suits the clients needs. The requested streams are then buffered to overcome delays as previously disclosed). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein requesting and buffering portions of video from at least one of the alternative streams using a playback device further comprises requesting and buffering portions of video from at least one of the alternative streams based upon the bitrates of the alternative streams and the measured streaming conditions using a playback device in the invention of Priyadarshi as taught by Kohli, so the delays can be covered and a set bit rate file can be sent to the client (Kohli; Paragraphs [0159]-[0160]).

Netflix, Inc. and Hulu, LLC - Ex. 1002, Page 0328
IPR2020-00558 (Netflix, Inc. and Hulu, LLC v. DivX, LLC)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/067167

Supplemental Box

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

Regarding claim 4, Priyadarshi discloses the method of claim 1, wherein the selected subtitle stream is stored within a container file that includes the font file as an attachment to the container file (Paragraphs [0021] and [0038]; the font files for the subtitles are electronic data files containing a set of representations for displaying characters or symbols where the containers can include an attachment link).

Regarding claim 5, Priyadarshi discloses the method of claim 4, wherein the container file in which the selected subtitle stream is stored includes a separate element containing metadata describing the attached font file (Paragraph [0038] and Claim 11; the font file can include metadata tags in the file such as the description, start time and end time for each attachment).

Regarding claim 6, Priyadarshi discloses the method of claim 5, further comprising determining whether the font file is present on the playback device without downloading the font file by requesting the metadata describing the attached font file from the container file using the playback device (Fig. 6 and Paragraph [0038]; using the description in each multimedia container the system can determine if an attachment font link is/file is necessary for each time period in a movie).

Regarding claim 7, Priyadarshi discloses the method of claim 5, wherein the metadata describing the attached font file includes a description of the font file and the location of the font file within the container file (Fig. 6 and Paragraph [0038]; using the description in each multimedia container the system can determine if an attachment font link is/file is necessary for each time period in a movie).

Regarding claim 8, Priyadarshi discloses the method of claim 1, but Priyadarshi does not disclose wherein the font file is compressed and the method further ~~comprises~~ decompressing the downloaded font file using the playback device. Kohli teaches wherein the font file is compressed and the method further comprises decompressing the downloaded font file using the playback device (Paragraph [0080]; the video information can include compressed and/uncompressed video data and video attributes (font files)). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the font file is compressed and the method further comprises decompressing the downloaded font file using the playback device in the invention of Priyadarshi as taught by Kohli, so space can be conserved (Kohli, Paragraphs [0060]).

Regarding claim 9, Priyadarshi discloses the method of claim 1, but Priyadarshi does not disclose wherein the selected subtitle stream is selected by the playback device in response to a user instruction. However turning on subtitles on a movie is a known practice in the art and would simply be a matter of inventor design choice. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the selected subtitle stream is selected by the playback device in response to a user instruction in the invention of Priyadarshi so users can see corresponding text to videos if necessary or desired.

Regarding claim 10, Priyadarshi discloses the method of claim 1, but Priyadarshi does not disclose displaying a user interface indicative of the estimated time to download the at least one font file using the playback device. However displaying download information such as estimated download time in a media related system is a known practice in the art and the specifics would simply be a matter of inventor design choice. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include displaying a user interface indicative of the estimated time to download the at least one font file using the playback device in the invention of Priyadarshi so users can see how long till their media file is done downloading and plan their time accordingly.

Regarding claim 11, Priyadarshi discloses the method of claim 1, wherein the subtitle stream is encoded as Unicode text (Paragraph [0005]; the fonts/subtitles can be encoded using Unicode encoding).

Regarding claim 12, Priyadarshi discloses the method of claim 1, wherein requesting and buffering at least a portion of the selected subtitle stream comprises downloading and buffering the entire subtitle stream prior to the commencement of playback (Paragraph [0031]; all textual elements (subtitles) can be extracted, buffered and then decoded for playback)

Regarding claim 13, Priyadarshi discloses the method of claim 1, wherein requesting and buffering at least a portion of the selected subtitle stream comprises requesting and buffering segments of the subtitle stream with timing corresponding to the timing of the portions of video requested by the playback device (Fig. 6 and Paragraphs [0033] and [0036]; the font file portions can be segmented to smaller sized segments that correspond to time segments within the overall movie timeline as shown in figure 6).

Regarding claim 14, Priyadarshi discloses the method of claim 13, wherein the font used to render the subtitle track is contained within a plurality of font files and at least one of the plurality of font files corresponds to a segment of the subtitle stream (Fig. 6 and Paragraphs [0033] and [0036]; the font file portions can be segmented to smaller sized segments that correspond to time segments within the overall movie timeline as shown in figure 6), the method further comprising downloading the font file corresponding to a segment of the subtitle stream when the playback device requests the segment of the subtitle stream (Paragraphs [0036] and [0038]; font files corresponding to a particular time can be attached/downloaded as necessary to display subtitles during that time period).

Regarding claim 15, Priyadarshi discloses the method of claim 14, wherein the font used to render the subtitle track is active according to an associated start timecode and end timecode, and the start and end timecodes are independent of the subtitle segment times (Paragraph [0036]; the fonts rendered for each time periods can be downloaded based on font attachment file start and end times).

Regarding claim 16, Priyadarshi discloses the method of claim 15, wherein start and end timecodes for a plurality of font segments overlap, and lead to multiple font segments being utilized for rendering subtitles at a given time (Paragraphs [0036] and [0036]; the video can have multiple font files which are associated with the overall timeline with all the files being attached to the movie based on a corresponding start and end time of the font attachment file).

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/067167

Supplemental Box

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

Continuation of:

Regarding claim 17, Priyadarshi discloses the method of claim 1, wherein: the streams and the subtitle stream are stored in separate container files (Paragraphs [0036] and [0038]; the video can have multiple font container files which are associated with the overall timeline with all the files being attached to the movie based on a corresponding start and end time of the font attachment file). Priyadarshi does not disclose wherein requesting portions of a stream further comprising requesting portions of files from remote servers via Hypertext Transfer Protocol (HTTP) byte range requests using the playback device. Kohli teaches wherein requesting portions of a stream further comprising requesting portions of files from remote servers via Hypertext Transfer Protocol (HTTP) byte range requests using the playback device (Paragraphs [0114]-[0115]; the server can be a HTTP server and the client can request content by byte ranges). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein requesting portions of a stream further comprising requesting portions of files from remote servers via Hypertext Transfer Protocol (HTTP) byte range requests using the playback device in the invention of Priyadarshi as taught by Kohli, so the managing device can server the appropriate content to the user (Kohli; Paragraphs [0114]-[0115]).

Regarding claim 24, Priyadarshi discloses the method of claim 1, but Priyadarshi does not disclose retrieving a top level index file using the playback device that identifies the alternative streams and identifies at least one subtitle stream. Kohli teaches retrieving a top level index file using the playback device that identifies the alternative streams and identifies at least one subtitle stream (Paragraph [0041]; the video file format information (which include the subtitle information as previously disclosed) can be stored in a server side index table (top level index file) that can be used to quickly be used to find the associated frame for each new bit rate video stream). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include retrieving a top level index file using the playback device that identifies the alternative streams and identifies at least one subtitle stream in the invention of Priyadarshi as taught by Kohli, so the index can be used to quickly find the associated frame for each new bit rate video stream (Kohli; Paragraph [0041]).

Regarding claim 25, Priyadarshi discloses a playback device configured to playback encoded media (Fig. 1 and Paragraphs [0006], [0027] and [0030]; the invention is to a playback system that displays multimedia files with rendered font and text subtitles that match the video file. The multimedia presentation is analyzed by an encoder/decoder to determine the unique character for each movie/video), where the media is encoded as a stream and at least one subtitle stream (Fig. 5, Paragraphs [0027], [0030] and [0036]; the stream of data includes encoded movie stream data and subtitle information that corresponds to the movie data. With the subtitle information being several font files (31, 32, 33) that correspond to the over time stream of video data), the playback device comprising: a processor configured to request portions of files (Paragraph [0010]; the system includes a processor that is configured to extract/request text data from a multimedia file having audio and video data) wherein the processor is configured to: request and buffer portions of video from at least one of the streams (Fig. 4 and Paragraph [0031]; video textual elements are sent to a character buffer for playback processing); request information indicative of a font utilized by a font-rendering engine to render text from a selected subtitle stream (Fig. 6 and Paragraphs [0021], [0026]-[0027] and [0038]; font files are used by a rendering module (font-rendering engine) to render the text or characters displayed with the movie stream); download at least one font file when the font is not present on the playback device (Paragraphs [0020], [0035] and [0038]; the necessary font files can be downloaded as an attachment); request and buffer at least a portion of the selected subtitle stream (Fig. 4 and Paragraph [0031]; video textual elements are sent to a character buffer for playback processing); decode the buffered portions of video (Paragraphs [0030]-[0031] and [0033]; the buffered portions can be sent to a decoder for decoding of the text, audio and video portions); render the portions of the subtitle stream corresponding to the buffered portion of video using a font-rendering engine configured by the at least one downloaded font file (Fig. 6 and Paragraphs [0021], [0026]-[0027] and [0038]; font files are used by a rendering module (font-rendering engine) to render the text or characters displayed with the movie stream); and perform synchronized playback of the decoded video and rendered subtitles (Fig. 6 and Paragraph [0038]; using start and end time code values the font files (31, 32, 33 - subtitles) are associated (synchronized) with their corresponding decoded video presentation timeline segments). Priyadarshi does not disclose wherein the streams are a plurality of alternative streams; wherein the processor is configured by a client application; wherein the requested portions are from a remote server. However in disclosing a system of streaming media content (Abstract), Kohli teaches wherein the streams are a plurality of alternative streams (Figs. 1 and 5 and Paragraphs [0027], [0030] and [0162]; multiple media flow directors (alternative streams) can be used to deliver and stream media content to a user device); wherein the processor is configured by a client application (Paragraph [0166]; the system can have an input device that receives and sends client commands (client application) to the processor); wherein the requested portions are from a remote server (Paragraphs [0151] and [0173]; the requested code information can be received from a remote server (630)). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the streams are a plurality of alternative streams; wherein the processor is configured by a client application; wherein the requested portions are from a remote server in the invention of Priyadarshi as taught by Kohli, so the multiple media flow directors can be used to efficiently deliver the media content to a user (Kohli; Paragraph [0162]).

Claims 18-23 lack an inventive step under PCT Article 33(3) as being obvious over Priyadarshi et al. (US 2009/0303241 A1; hereinafter Priyadarshi) in view of Kohli et al. (WO 2010/060106 A1; hereinafter Kohli) in further view of Soroushian et al. (US 2009/0132599 A1; hereinafter Soroushian).

Regarding claim 18, Priyadarshi discloses the method of claim 1, but Priyadarshi does not disclose wherein the alternative streams and the subtitle stream are stored in separate Extensible Binary Markup Language (EBML) container files. However in disclosing a playback and distribution system (Abstract), Soroushian teaches wherein the alternative streams and the subtitle stream are stored in separate Extensible Binary Markup Language (EBML) container files (Fig. 9 and Paragraph [0042]; media files (which would include the subtitles) are stored in extensible Binary Meta Language (EBML) elements (containers)). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the alternative streams and the subtitle stream are stored in separate Extensible Binary Markup Language (EBML) container files in the invention of Priyadarshi as taught by Soroushian, so the media file can be easily indexed (Soroushian; Paragraph [0042]).

Form PCT/ISA/237 (Supplemental Box) (July 2011)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/067167

Supplemental Box

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

Regarding claim 19, Priyadarshi discloses the method of claim 18, wherein each of the container files comprises a plurality of Cluster elements, where each Cluster element contains a portion of encoded media (Fig. 6 and Paragraphs [0033] and [0036]; the font file portions can be segmented in smaller sized segments (clusters) that correspond to time segments within the overall movie timeline as shown in figure 6). But Priyadarshi does not disclose wherein the container files are EBML container files. However in disclosing a playback and distribution system (Abstract), Soroushian teaches wherein the container files are EBML container files. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the container files are EBML container files in the invention of Priyadarshi as taught by Soroushian, so the media file can be easily indexed (Soroushian; Paragraph [0042]).

Regarding claim 20, Priyadarshi discloses the method of claim 19, wherein the portions of encoded media in each of the Cluster elements have the same duration (Paragraph [0037]; the font files can all be of an approximate equal size and duration).

Regarding claim 21, Priyadarshi discloses the method of claim 20, but Priyadarshi does not disclose wherein the portions of encoded media in each of the Cluster elements have a 2 second duration. However setting a segment to a particular duration is disclosed by Priyadarshi as disclosed in claim 20 and specifically setting the duration to 2 seconds would simply be a matter of inventor design choice. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the portions of encoded media in each of the Cluster elements have a 2 second duration in the invention of Priyadarshi, so the font files can all span an approximately equal amount of time within a movie (Priyadarshi; Paragraph [0037]).

Regarding claim 22, Priyadarshi discloses the method of claim 18, wherein the container file containing the selected subtitle stream includes at least one font file as an attachment to the container file (Paragraphs [0021] and [0038]; the font files for the subtitles are electronic data files containing a set of representations for displaying characters or symbols where the containers can include an attachment link). But Priyadarshi does not disclose wherein the container files are EBML container files. However in disclosing a playback and distribution system (Abstract), Soroushian teaches wherein the container files are EBML container files. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the container files are EBML container files in the invention of Priyadarshi as taught by Soroushian, so the media file can be easily indexed (Soroushian; Paragraph [0042]).

Regarding claim 23, Priyadarshi discloses the method of claim 22, but Priyadarshi does not disclose wherein the at least one font file attached to the container file are compressed. Kohli teaches wherein the at least one font file attached to the container file are compressed (Paragraph [0080]; the video information can include compressed and/uncompressed video data and video attributes (font files)). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include wherein the at least one font file attached to the container file are compressed in the invention of Priyadarshi as taught by Kohli, so space can be conserved (Kohli; Paragraphs [0080]).

Claims 1-25 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.

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference D1:02359AB.PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2011/068276	International filing date *(day/month/year)* 31 December 2011	(Earliest) Priority Date *(day/month/year)* 01 September 2011
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. 1A

☐ 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.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/068276

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H04L 9/18 (2013.01)
USPC - 380/255
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)
IPC(8) - H04L 9/00, 9/08, 9/14, 9/18, (2013.01)
USPC - 380/1, 45, 255, 269, 277, 281

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
CPC- H04L 9/00, 9/08, 9/14, 9/18, (2013.01)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Orbit, Google Patents, Google Scholar

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2009/0290706 A1 (AMINI et al) 26 November 2009 (26.11.2009) entire document	1, 2, 14, 15, 27, 28 --- 3-13, 16-26, 29-105
Y	WO 2011/103364 A1 (THORWIRTH) 25 August 2011 (25.08.2011) entire document	4-13, 17-26, 29-105
Y	US 2009/0328228 A1 (SCHNELL) 31 December 2009 (31.12.2009) entire document	3, 10-13, 16, 23-26, 29-66, 68, 70-83, 85, 87-102, 104
Y	US 2009/0132721 A1 (SOROUSHIAN et al) 21 May 2009 (21.05.2009) entire document	9-13, 22-26, 34, 35, 41-48, 54, 55, 59-66, 68, 75-83, 85, 94-102, 104

☐ 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 June 2013	08 JUL 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: Blaine R. Copenheaver 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, SUITE 1050
ANAHEIM, CA 92806

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	08 JUL 2013
Applicant's or agent's file reference D1:02359AB.PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2011/068276	31 December 2011	01 September 2011

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04L 9/18 (2013.01)
USPC - 380/255

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 June 2013	Blaine R. Copenheaver 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/US2011/068276

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:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
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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	3-13, 16-26, 29-105	YES
	Claims	1, 2, 14, 15, 27, 28	NO
Inventive step (IS)	Claims	None	YES
	Claims	105	NO
Industrial applicability (IA)	Claims	105	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1, 2, 14, 15, 27, 28 lack novelty under PCT Article 33(2) as being anticipated by Amini et al., hereinafter referred to as Amini.

Regarding claim 1, Amini discloses a source encoder (multi-encoder platform 220, para 0031, see fig. 2 [whose components are shown in the computing system of fig. 11, para 0068]), comprising: a processor (processor 1102, para 0068, 0069, see fig. 11); non-volatile storage containing an encoding application (memory 1104 [RAM or ROM (nonvolatile)], para 0068, 0069, see fig. 11); wherein the encoding application configures the processor to: receive source content (a stream source 210 offers unencoded access units [frames] to the encoder, para 0031, see fig. 2); obtain common cryptographic information (encryptor 240 where the streams are encrypted, para 0032, see fig. 2; same key is used for different streams [common cryptographic information], para 0054); encode the source content as a plurality of streams including a plurality of alternative streams of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2); and protect the plurality of alternative streams of content using the common cryptographic information (same key is used for different streams, para 0054, 0044 [protecting the content]).

Regarding claim 14, Amini discloses a method of encoding source content as a plurality of protected streams using common cryptographic information (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2), comprising: receiving source content using a source encoder (a stream source 210 offers unencoded access units [frames] to the encoder, para 0031, see fig. 2); obtaining common cryptographic information using a source encoder (encryptor 240 where the streams are encrypted, para 0032, see fig. 2; same key is used for different streams [common cryptographic information], para 0054); encoding the source content as a plurality of streams including a plurality of alternative streams of content using the source encoder (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2); and protecting the plurality of alternative streams of content using the source encoder and the common cryptographic information (same key is used for different streams, para 0054, 0044 [protecting the content]).

Regarding claim 27, Amini discloses a machine readable medium containing processor instructions (machine readable medium, claim 26; multi-encoder platform 220, para 0031, see fig. 2 [whose components are shown in the computing system of fig. 11, para 0068]), where execution of the instructions by a processor causes the processor to perform a process (processor 1102, para 0068, 0069, see fig. 11) comprising receiving source content using a source encoder (a stream source 210 offers unencoded access units [frames] to the encoder, para 0031, see fig. 2); obtaining common cryptographic information using a source encoder (encryptor 240 where the streams are encrypted, para 0032, see fig. 2; same key is used for different streams [common cryptographic information], para 0054); encoding the source content as a plurality of streams including a plurality of alternative streams of content using the source encoder (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2); and protecting the plurality of alternative streams of content using the source encoder and the common cryptographic information (same key is used for different streams, para 0054, 0044 [protecting the content]).

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Regarding claims 2 and 15, Amini teaches wherein the encoding application configures the processor to encode and protect the source content by configuring the processor to: encode a portion of source content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2); and encrypt at least one portion of the encoded portion of content so that the at least one encrypted portion can be accessed using the common cryptographic information (same key is used for different streams [which are encrypted using the encryptor 220, para 0032, see fig. 2], para 0054, 0044 [protecting the content]).

Regarding claim 28, Amini discloses wherein the machine readable medium is non-volatile memory (memory 1104 with ROM [non-volatile], para 0068, 0069, see fig. 11).

Claims 29-33, 36-40, 49-53, 56-58 lack an inventive step under PCT Article 33(3) as being obvious over Thorwirth and in view of Schnell and further in view of Amini.

Regarding claim 29, Thorwirth discloses a content distribution system (system for enhancing security of content distribution, para 0018), comprising a content distribution server (content ingested on server 301 part of a content distribution network, para 0052),where the content distribution server stores a plurality of content files containing alternative streams of protected content associated with a title (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),the alternative streams of protected content are protected using cryptographic information (the chunks are protected using different watermark payloads, para 0052), and each content file includes a copy of the cryptographic information 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); wherein a server is configured to: receive a request for access to the alternative streams of protected content associated with the title from a playback device (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]);and securely provide a copy of the at least one encryption key used to encrypt the cryptographic information to 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);and wherein the content distribution server is configured to grant the playback device access to the alternative streams of protected content (server provides access to the client based on the selection or chunks requested, para 0053). Thorwirth lacks the teaching of comprising: a DRM server; a container file; common cryptographic information. 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]). Further, Schnell is in the field of segmented media content rights management (abstract, title) and 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). Furthermore, 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 49, Thorwirth discloses a method of distributing content encoded as a plurality of alternative streams of protected content (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), where the alternative streams of protected content are protected using cryptographic information (the chunks are protected using different watermark payloads, para 0052) and each stream of protected content includes a copy of the cryptographic information 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), the method comprising: receiving a request for access to the alternative streams of protected content associated with the title from a playback device using a server (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]); securely providing to the playback device at least one encryption key using the server (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), where the at least one encryption key is used to access the encrypted cryptographic information (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058); and granting the playback device access to the alternative streams of protected content using a content distribution server (content ingested on server 301 part of a content distribution network, para 0052; server provides access to the client based on the selection or chunks requested, para 0053).Thorwirth lacks the teaching of comprising: a DRM server; a container file; common cryptographic information. 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]). Further, Schnell is in the field of segmented media content rights management (abstract, title) and 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). Furthermore, 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).

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Regarding claim 30, Thorwirth as modified teaches wherein the server is configured to associate a title ID with the title (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]; the chunks are protected using different watermark payloads, para 0052). Thorwirth lacks the teaching of a DRM server. 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).

Regarding claim 31, Thorwirth teaches wherein server is configured to associate the cryptographic information with the title ID (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]; the chunks are protected using different watermark payloads, para 0052). Thorwirth lacks the teaching of a DRM server and a common cryptographic information. 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). Furthermore, 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 32, Thorwirth teaches wherein the request for access to the alternative streams of protected content associated with the title comprises a request identifying a title ID (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]; the chunks are protected using different watermark payloads, para 0052).

Regarding claim 33, Thorwirth teaches wherein the content distribution server is further configured to: receive requests for portions of at least one container file from the playback device (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]); and provide the requested portions of the at least one container file to the playback device (server provides access to the client based on the selection or chunks requested para 0053).

Regarding claim 36, Thorwirth teaches obtain common cryptographic information from the server (the chunks are protected using different watermark payloads, para 0052); receive source content, encode the source content as a plurality of streams including a plurality of alternative streams of content (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); protect the plurality of alternative streams of content using cryptographic information (the chunks are protected using different watermark payloads, para 0052); protect the cryptographic information 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 provide a plurality of content files containing the plurality of alternative streams of protected content to the content distribution server (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). However, Thorwirth lacks the teaching of a source encoder, common cryptographic information and a DRM server, container files. 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]). Further, Schnell is in the field of segmented media content rights management (abstract, title) and 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). Furthermore, Amini teaches a content distribution source encoder (multi-encoder platform 220, para 0031, see fig. 2 [whose components are shown in the computing system of fig. 11, para 0068]) 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).

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Regarding claim 37, Thorwirth lacks the teaching wherein the source encoder is configured to: encode a portion of content; and encrypt at least one portion of the encoded content so that the at least one encrypted portion can be accessed using the common cryptographic information. Amini teaches wherein the source encoder is configured to: encode a portion of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2); and encrypt at least one portion of the encoded portion of content so that the at least one encrypted portion can be accessed using the common cryptographic information (same key is used for different streams [which are encrypted using the encryptor 220, para 0032, see fig. 2], 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 38, Thorwirth lacks the teaching wherein the source encoder is configured to write each of the alternative streams of protected content to a separate container file. However, Thorwirth shows wherein the alternative streams of protected content are written into a container file is well known in the art (sections of multiple files are created with pointers within a container file, para 0004, 0010). 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 feature 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).

Regarding claim 39, Thorwirth teaches each stream of protected content includes a copy of the cryptographic information 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), but lacks the teaching wherein the source encoder is configured to process common cryptographic information. 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).

Regarding claim 40, Thorwirth teaches wherein the source encoder is configured to encrypt at least a portion of the cryptographic information using a single encryption key and write the encrypted information to each of the container files containing the alternative streams of protected content (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058), but lacks the teaching wherein the source encoder is configured to process common cryptographic information. 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).

Regarding claim 50, Thorwirth teaches wherein the title is identified using a title ID (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]; the chunks are protected using different watermark payloads, para 0052).

Regarding claim 51, Thorwirth teaches wherein the common cryptographic information is associated with the title ID (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]; the chunks are protected using different watermark payloads, para 0052). 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).

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Regarding claim 52, Thorwirth teaches wherein the request for access to the alternative streams of protected content associated with the title comprises a request identifying a title ID (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]; the chunks are protected using different watermark payloads, para 0052).

Regarding claim 53,Thorwirth teaches receiving requests for portions of at least one container file from the playback device using the content distribution server (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]); and providing the requested portions of the at least one container file to the playback device using the content distribution server (server provides access to the client based on the selection or chunks requested para 0053).

Regarding claim 56, Thorwirth teaches obtain common cryptographic information from the server (the chunks are protected using different watermark payloads, para 0052); receive source content, encode the source content as a plurality of streams including a plurality of alternative streams of content (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); protect the plurality of alternative streams of content using cryptographic information (the chunks are protected using different watermark payloads, para 0052); protect the cryptographic information 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 provide a plurality of content files containing the plurality of alternative streams of protected content to the content distribution server (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). However, Thorwirth lacks the teaching of a source encoder, common cryptographic information and a DRM server, container files. 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]). Further, Schnell is in the field of segmented media content rights management (abstract, title) and 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). Furthermore, Amini teaches a content distribution source encoder (multi-encoder platform 220, para 0031, see fig. 2 [whose components are shown in the computing system of fig. 11, para 0068]) 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 57, Thorwirth lacks the teaching of encoding a portion of content using the source encoder; and encrypting at least one portion of the encoded content using the source encoder so that the at least one encrypted portion can be accessed using the common cryptographic information. Amini teaches wherein the source encoder is configured to: encode a portion of content (multi-encoder 220 generates multiple encoded access units and gives alternate or multiple streams, para 0031, see fig. 2); and encrypt at least one portion of the encoded portion of content so that the at least one encrypted portion can be accessed using the common cryptographic information (same key is used for different streams [which are encrypted using the encryptor 220, para 0032, see fig. 2], 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 58, Thorwirth lacks the teaching wherein the source encoder is configured to write each of the alternative streams of protected content to a separate container file. However, Thorwirth shows wherein the alternative streams of protected content are written into a container file is well known in the art (sections of multiple files are created with pointers within a container file, para 0004, 0010). 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 feature 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).

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Claims 67, 69, 84, 86, 103, 105 lack an inventive step under PCT Article 33(3) as being obvious over Thorwirth and in view of Amini.

Regarding claim 67, Thorwirth discloses a playback device (client device or user requests access for playback, para 0053), comprising: a processor (client device is a personal computer 404, mobile phone 406 or consumer electronics device 408 [a processor is inherent], para 0056, see fig. 4); memory containing a client application (client device is a personal computer 404, mobile phone 406 or consumer electronics device 408 [a memory is inherent], para 0056, see fig. 4); wherein the client application configures the processor to: request a file identifying a plurality of alternative streams of protected content (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]),where each of the alternative streams of protected content are encrypted using cryptographic information (the chunks are protected using different watermark payloads, para 0052); request portions of content from at least the plurality of alternative streams of protected content (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]); access the protected content using the cryptographic information (content ingested on server 301 part of a content distribution network, para 0052; server provides access to the client based on the selection or chunks requested, para 0053); and playback the content (playback of content on the client device, para 0053). Thorwirth lacks the teaching of a top level index file obtain the common cryptographic information. However, Thorwirth teaches a top level index file is well known in the art (top level index file pointing to a number of alternate streams that contain actual video and audio data, para 0009). 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).

Regarding claim 84, Thorwirth discloses a method of performing adaptive bitrate streaming using a plurality of alternative streams of protected content (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 [chunks differ in encoding and bit rat : adaptive bitrate streaming system, para 0005]), where each of the streams of protected content is protected using cryptographic information (), the method comprising: requesting a file identifying a plurality of alternative streams of protected content using a playback device (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]), where each of the alternative streams of protected content are encrypted using cryptographic information (the chunks are protected using different watermark payloads, para 0052); obtaining the cryptographic information using 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); requesting portions of content from at least the plurality of alternative streams of protected content using the playback device (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]); accessing the protected content using the playback device and the cryptographic information (content ingested on server 301 part of a content distribution network, para 0052; server provides access to the client based on the selection or chunks requested, para 0053); and playing back the content using the playback device (playback of content on the client device, para 0053).Thorwirth lacks the teaching of a top level index file obtain the common cryptographic information. However, Thorwirth teaches a top level index file is well known in the art (top level index file pointing to a number of alternate streams that contain actual video and audio data, para 0009). 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).

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Regarding claim 103, Thorwirth discloses a machine readable medium containing processor instructions, where execution of the instructions by a processor causes the processor to perform a process (implementation process, para 0047 [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]) comprising: request a file identifying a plurality of alternative streams of protected 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]), where each of the alternative streams of protected content are encrypted using cryptographic information (the chunks are protected using different watermark payloads, para 0052); obtaining the cryptographic information (the content keys used to encrypt the content are encrypted using a key unique to a specific user or client device, para 0058); requesting portions of content from at least the plurality of alternative streams of protected content (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]); accessing the protected content using the cryptographic information (content ingested on server 301 part of a content distribution network, para 0052; server provides access to the client based on the selection or chunks requested, para 0053); and playing back the content (playback of content on the client device, para 0053).Thorwirth lacks the teaching of a top level index file obtain the common cryptographic information. However, Thorwirth teaches a top level index file is well known in the art (top level index file pointing to a number of alternate streams that contain actual video and audio data, para 0009). 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).

Regarding claims 69 and 86, Thorwirth lacks the teaching wherein each of the alternative streams of protected content is contained within a separate container file; and the top level index file identifies a container file containing each of the alternative streams. 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).

Regarding claim 105, Thorwirth lacks the teaching wherein the machine readable medium is non-volatile memory. Amini teaches wherein the machine readable medium is non-volatile memory (memory 1104 with ROM [non-volatile], para 0068, 0069, see fig. 11). 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 non-volatile memory for storing 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 3, 16 lack an inventive step under PCT Article 33(3) as being obvious over Amini and in view of Schnell.

Regarding claims 3 and 16, Amini lacks the teaching wherein the encoding application configures the processor to obtain common cryptographic information by configuring the processor to: send a request to a DRM server for common cryptographic information; and receive the common cryptographic information from the DRM server. However, 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). Further, Schnell teaches a DRM system that sends cryptographic information to the media device (DRM system 118 with domain controller 124 and license server 126, where the DRM system encrypts the media content, licenser server can issue DRM licenses before media content by various media devices, para 0022, 0023 [media device 202 also includes DRM platform 21 to receive the DRM license, para 0034]).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).

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Claims 4-8, 17-21 lack an inventive step under PCT Article 33(3) as being obvious over Amini and in view of Thorwirth.

Regarding claims 4 and 17, Amini teaches the common cryptographic content and the plurality of alternative streams of protected content (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), but lacks the teaching wherein a title is associated with the common cryptographic content and the plurality of alternative streams of protected content. Thorwirth teaches a title is associated with the cryptographic content and the plurality of alternative streams of protected content (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]; the chunks are protected using different watermark payloads, para 0052). 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 title feature in the invention of Amini for the purpose of providing the content distribution server a link that includes a unique identifier that enables the server to determine the information to be embedded in the chunk (Thorwirth, para 0057).

Regarding claims 5 and 18, Amini lacks the teaching wherein the encoding application configures the processor to write each of the alternative streams of protected content to a separate container file. However, Thorwirth shows wherein the alternative streams of protected content are written into a container file is well known in the art (sections of multiple files are created with pointers within a container file, para 0004, 0010). 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 feature in the invention of Amini 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).

Regarding claims 6 and 19, 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), but lacks the teaching of the cryptographic information encrypted using at least one encryption key to each of the container files containing the alternative streams of protected content. Thorwirth teaches each stream of protected content includes a copy of the cryptographic information 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). 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 key in the invention of Amini for the purpose of providing an encryption key unique to a specific user or client device and the encrypted data is delivered securely and individually to the user and/or client device (Thorwirth, para 0058).

Regarding claims 7 and 20, Amini teaches wherein writing the 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), but lacks the teaching of writing to the container files containing the alternative streams of protected content comprises encrypting the at least a portion of the common cryptographic information written to each of the container files using at least one encryption key. Thorwirth teaches each stream of protected content includes a copy of the cryptographic information 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). 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 key in the invention of Amini for the purpose of providing an encryption key unique to a specific user or client device and the encrypted data is delivered securely and individually to the user and/or client device (Thorwirth, para 0058).

Regarding claims 8 and 21, Amini teaches wherein writing the 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), but lacks the teaching of writing to the container files containing the alternative streams of protected content comprises encrypting the at least a portion of the common cryptographic information written to each of the container files using the same encryption key. However, Thorwirth teaches each stream of protected content includes a copy of the cryptographic information 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). Further, encrypting the content for protection is well known in the art and the specifics (using same encryption key) 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 key in the invention of Amini for the purpose of providing an encryption key unique to a specific user or client device and the encrypted data is delivered securely and individually to the user and/or client device (Thorwirth, para 0058).

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Claims 9, 22 lack an inventive step under PCT Article 33(3) as being obvious over Amini and in view of Thorwirth and further in view of Soroushian et al., hereinafter referred to as Soroushian.

Regarding claims 9 and 22, Amini lacks the teaching wherein the container files are Matroska container files. Soroushian is in the field of playback and distribution systems (abstract) and further 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 Amini 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).

Claims 10-13, 23-26 lack an inventive step under PCT Article 33(3) as being obvious over Amini and in view of Thorwirth and further in view of Soroushian and even further in view of Schnell.

Regarding claims 10 and 23, Amini teaches 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) wherein, but lacks the teaching wherein the encoding application configures the processor to write a DRMHeader element to the TracksData element in a Tracks element within each of the Matroska container files, where the DRMHeader element includes an encrypted copy of the common cryptographic information. 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 Amini 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 Amini 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 11 and 24, Amini teaches 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) wherein, but lacks the teaching wherein the common cryptographic information is a set of encryption keys; the encoding application configures the processor to: encrypt the set of encryption keys using at least one encryption key; and write the encrypted set of encryption keys to the DRMHeader element of each of the Matroska container files. Thorwirth teaches 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). 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 key in the invention of Amini for the purpose of providing an encryption key unique to a specific user or client device and the encrypted data is delivered securely and individually to the user and/or client device (Thorwirth, para 0058). 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 Amini 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). Further, 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 Amini 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).

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Regarding claims 12 and 25, Amini teaches wherein: the source content includes a stream of video (bitstreams are series of compressed data units (video frames), para 0037); and the encoding application configures the processor to: encode a frame of video (encoding parameters generate several compressed data units of the original, para 0037); protect the encoded frame of video by encrypting at least a portion of the encoded frame of video (encryption is done, para 0041, encryptor 240 where the streams are encrypted, para 0032, see fig. 2; same key is used for different streams [common cryptographic information], para 0054). Amini lacks the teaching to write a BlockGroup element to a Matroska container file including a DRMinfo element identifying the at least one portion of the encoded frame of video that is encrypted and at least one encryption key from the set of encryption keys used to access the at least one encrypted portion of the encoded frame of video. 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 Amini 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 a DRMinfo element identifying the protected encoded element and using an encryption key from the set of encryption keys used to access the encrypted encoded content (file header object 218 [DRM header element] has the DRM licenses for the protected media content, para 0036; tracks objects 22 which has the track attributes and segment data to identify the content, 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 Schnell to incorporate the DRM elements in the invention of Amini 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 13 and 26, Amini lacks the teaching wherein the encoding application further configures the processor to: generate an index for each Matroska container file during the encoding of each of the streams of protected content; and write a Cues element containing the index to the indexed 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]). 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 Amini 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 Amini 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).

Claims 34, 35, 41-46, 54, 55, 59-66 lack an inventive step under PCT Article 33(3) as being obvious over Thorwirth and in view of Schnell and further in view of Amini and even further in view of Soroushian.

Regarding claim 34, 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 claim 35, 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).

Regarding claim 41, Thorwirth lacks the teaching wherein the container files are Matroska container files. Soroushian is in the field of playback and distribution systems (abstract) and further 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).

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Regarding claim 42, Thorwirth lacks the teaching wherein the source encoder is configured to write a DRMHeader element to a TracksData element in a Tracks element within each of the Matroska container files, where the DRMHeader element includes an encrypted copy of the common cryptographic information. 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).

Regarding claim 43, 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 of each of the Matroska container files. 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). 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). Further, 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 claim 44, Thorwirth wherein: the source content includes a stream of video (content ingested on server 301 part of a content distribution network, para 0052 [video]); and configured to: encode a frame from the stream 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); protect the encoded frame of video by encrypting at least a portion of the encoded frame of video (the chunks are protected using different watermark payloads, para 0052), but lacks the teaching wherein to write a BlockGroup element to a Matroska container file including a DRMinfo element identifying the at least one portion of the encoded frame of video that is encrypted and at least one encryption key from the set of encryption keys used to access the at least one encrypted portion of the encoded frame of video. 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 a DRMinfo element identifying the protected encoded element and using an encryption key from the set of encryption keys used to access the encrypted encoded content (file header object 218 [DRM header element] has the DRM licenses for the protected media content, para 0036; tracks objects 22 which has the track attributes and segment data to identify the content, 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 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).

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Regarding claim 45, Thorwirth lacks the teaching wherein the source encoder is configured to: generate an index for each Matroska container file during the encoding of each of the streams of protected content; and write a Cues element containing the index to the indexed 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]). 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).

Regarding claim 46, Thorwirth lacks the teaching wherein the container files are Matroska container files. Soroushian is in the field of playback and distribution systems (abstract) and further 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 claim 47, Thorwirth lacks the teaching wherein the source encoder is configured to write a DRMHeader element to a TracksData element in a Tracks element within each of the Matroska container files, where the DRMHeader element includes an encrypted copy of the common cryptographic information. 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).

Regarding claim 48, 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).

Regarding claim 54, 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).

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Regarding claim 55, 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).

Regarding claim 59, Thorwirth lacks the teaching wherein the container files are Matroska container files. Soroushian is in the field of playback and distribution systems (abstract) and further 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 claim 60, Thorwirth lacks the teaching wherein the source encoder is configured to write a DRMHeader element to a TracksData element in a Tracks element within each of the Matroska container files, where the DRMHeader element includes an encrypted copy of the common cryptographic information. 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).

Regarding claim 61, 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 of each of the Matroska container files. 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). 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). Further, 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).

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Regarding claim 62, Thorwirth wherein: the source content includes a stream of video (content ingested on server 301 part of a content distribution network, para 0052 [video]); and configured to: encode a frame from the stream 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); protect the encoded frame of video by encrypting at least a portion of the encoded frame of video (the chunks are protected using different watermark payloads, para 0052), but lacks the teaching wherein to write a BlockGroup element to a Matroska container file including a DRMinfo element identifying the at least one portion of the encoded frame of video that is encrypted and at least one encryption key from the set of encryption keys used to access the at least one encrypted portion of the encoded frame of video. 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 a DRMinfo element identifying the protected encoded element and using an encryption key from the set of encryption keys used to access the encrypted encoded content (file header object 218 [DRM header element] has the DRM licenses for the protected media content, para 0036; tracks objects 22 which has the track attributes and segment data to identify the content, 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 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 claim 63, Thorwirth lacks the teaching wherein the source encoder is configured to: generate an index for each Matroska container file during the encoding of each of the streams of protected content; and write a Cues element containing the index to the indexed 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]). 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).

Regarding claim 64, Thorwirth lacks the teaching wherein the container files are Matroska container files. Soroushian is in the field of playback and distribution systems (abstract) and further 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 claim 65, Thorwirth lacks the teaching wherein the source encoder is configured to write a DRMHeader element to a TracksData element in a Tracks element within each of the Matroska container files, where the DRMHeader element includes an encrypted copy of the common cryptographic information. 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).