UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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NETFLIX, INC.,
Petitioner,

v.

DIVX, LLC,
Patent Owner.

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IPR2020-00511
Patent 9,184,920 B2

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Before KEVIN F. TURNER, BART A. GERSTENBLITH, and
IFTIKHAR AHMED, *Administrative Patent Judges*.

GERSTENBLITH, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
Granting In Part and Dismissing In Part Petitioner's Motion to Exclude
35 U.S.C. § 318(a)

I.   INTRODUCTION

A.   Background

Netflix, Inc. ("Petitioner") filed a Petition (Paper 2, "Pet.") requesting institution of *inter partes* review of claims 1–3, 5, 6, 10–12, 14, and 15 ("the Challenged Claims") of U.S. Patent No. 9,184,920 B2 (Ex. 1001, "the '920 patent"). DivX, LLC ("Patent Owner") filed a Preliminary Response (Paper 6, "Prelim. Resp."). Applying the standard set forth in 35 U.S.C. § 314(a), we instituted an *inter partes* review of the Challenged Claims. Paper 7 ("Inst. Dec.").

After institution, Patent Owner filed a Request for Rehearing of Decision Granting Institution (Paper 11) and a request for the Precedential Opinion Panel ("POP") to review the Decision (Paper 14 (Notification of Receipt of POP Request)). POP denied the requested review (Paper 17), and we subsequently denied Patent Owner's Rehearing Request (Paper 20).

Patent Owner filed a Patent Owner Response (Paper 19, "PO Resp."), Petitioner filed a Reply to Patent Owner's Response (Paper 25, "Pet. Reply"), and Patent Owner filed a Sur-reply (Paper 30, "PO Sur-reply"). With prior authorization, Petitioner filed an Identification of Improper New Evidence and Arguments in Sur-reply (Paper 35, "Pet. ID") and Patent Owner filed a Response to Petitioner's Identification (Paper 38, "PO ID Resp."). In addition, Petitioner filed a Motion to Exclude Evidence (Paper 36, "Mot."), Patent Owner filed an Opposition to Petitioner's Motion (Paper 39, "Opp."), and Petitioner filed a Reply in support of its Motion (Paper 41, "Reply"). An oral hearing was held on May 12, 2021, and a copy of the transcript was entered in the record. Paper 45 ("Tr.").

We have jurisdiction pursuant to 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 as to the patentability of the claims on which we instituted trial. Petitioner bears the burden of proving unpatentability of the Challenged Claims, and the burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must prove unpatentability by a preponderance of the evidence. *See* 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2019). Having reviewed the arguments and the supporting evidence, we determine that Petitioner has not shown, by a preponderance of the evidence, that the Challenged Claims of the '920 patent are unpatentable. Additionally, for the reasons explained herein, we grant Petitioner's Motion to Exclude to the extent that we exclude Exhibits 2025 and 2028–2030 and do not consider Patent Owner's arguments based on these exhibits, raised on pages 7 and 18–20 of the Sur-reply, and we dismiss as moot Petitioner's Motion to Exclude as applied to Exhibits 2004–2006, 2008, 2010, 2011, 2014, 2015, and 2017–2023.

B. Related Proceedings

Petitioner and Patent Owner identify the following related matter: *DivX, LLC v. Netflix, Inc.*, No. 2:19-cv-01602 (C.D. Cal.). Pet. 81; Paper 4 (Patent Owner's Mandatory Notices), 1.

C. Real Parties in Interest

Petitioner identifies itself—Netflix, Inc.—as the sole real party in interest. Pet. 81. Patent Owner identifies itself—DivX, LLC—and DivX CF Investors LLC as the real parties in interest. Paper 4, 1.

>   D.   *The Instituted Grounds of Unpatentability and Declaration
>   Evidence*

Petitioner challenges the patentability of claims 1–3, 5, 6, 10–12, 14, and 15 of the '920 patent on the following grounds:

Claims Challenged	35 U.S.C. §[1]	Reference(s)/Basis
1, 10	103(a)	Chen,[2] Grab-333[3]
1–3, 10–12	103(a)	Chen, Grab-333, Candelore[4]
1, 3, 5, 6, 10, 12, 14, 15	103(a)	Chen, Grab-333, Kocher[5]

Pet. 10. Petitioner supports its challenge with two Declarations by Patrick D. McDaniel, Ph.D., executed February 5, 2020 (Ex. 1003, "the McDaniel Declaration") and February 9, 2021 (Ex. 1032, the "McDaniel Reply Declaration").

Patent Owner supports its arguments with two Declarations by Seth Nielson, Ph.D., dated May 21, 2020 (Ex. 2009, "the Nielson Declaration") and November 25, 2020 (Ex. 2024, "the Second Nielson Declaration"), and a Declaration by Bridget A. Smith, dated December 15, 2020 (Ex. 2026, "the Smith Declaration").

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[1] The Leahy-Smith America Invents Act ("AIA") included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the '920 patent has an effective filing date before March 16, 2013, we apply the pre-AIA version of § 103.

[2] U.S. Patent Application Publication No. US 2005/0177741 A1, published August 11, 2005 (Ex. 1004, "Chen").

[3] U.S. Patent Application Publication No. US 2004/0081333 A1, published April 29, 2004 (Ex. 1005, "Grab-333").

[4] U.S. Patent Application Publication No. US 2005/0063541 A1, published March 24, 2005 (Ex. 1006, "Candelore").

[5] International Patent Application Publication No. WO 2005/008385 A2, published January 27, 2005 (Ex. 1007, "Kocher").

E.   *The '920 Patent*

The '920 patent is directed to "digital rights management schemes and more specifically to playback certification schemes where various playback activities are enabled in a coordinated fashion by different entities within the system." Ex. 1001, 1:19–23. The '920 patent illustrates "a federated system for establishing playback parameters for digital content that includes trusted systems." *Id.* at 5:51–53. "Playback parameters define the actions that a playback device is able to perform with respect to a particular piece of digital content. Playback parameters can govern the playing, copying and/or distribution of the content." *Id.* at 5:53–57. The '920 patent explains that "[t]he system is referred to as federated, because no single system possesses all of the information required to set the playback parameters for a piece of content." *Id.* at 5:57–59.

The '920 patent describes a "registration system that registers playback devices." Ex. 1001, 6:14–15. The registration process includes establishing "one or more 'user encryption keys' that are known only to the playback device and the registration entity. The 'user encryption keys' can be unique to a device or user or the same encryption keys can be placed in a limited set of devices." *Id.* at 6:15–20. Once registered, a playback device can request content from a content provider who can encrypt the content using one or more encryption keys that are only known to the content provider. *Id.* at 6:20–24. "The content provider then provides the encryption keys used to encrypt the content to a trusted system provided by the registration entity. The trusted system then encrypts copies of the content provider's encryption keys using one or more of a user's 'user encryption keys.'" *Id.* at 6:24–28. Additionally, the trusted system can

encrypt additional information using one or more "base keys that can be known by all playback devices, a predetermined class of playback devices or specified groups of playback devices." *Id.* at 6:28–33.

The '920 patent also describes a process "for encrypting content and generating a playback certification." Ex. 1001, 11:44–46. Figure 6 of the '920 patent is reproduced below:
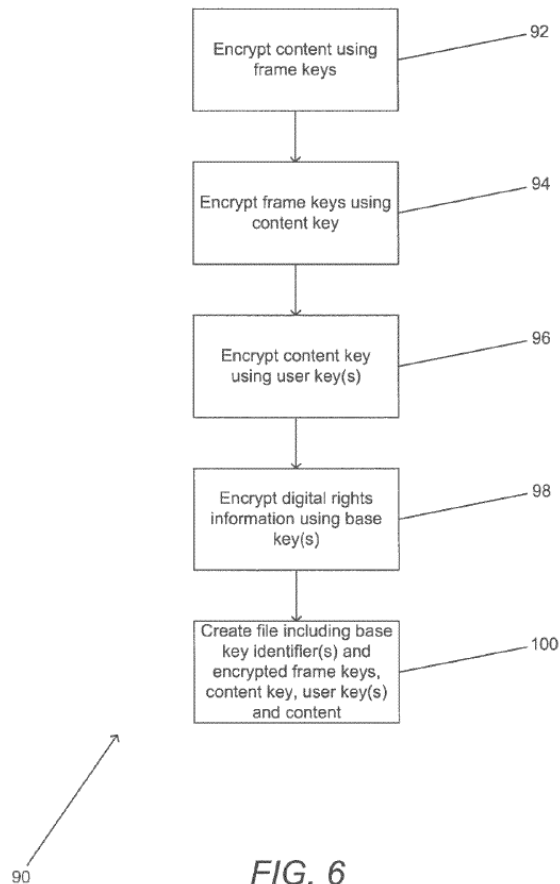

FIG. 6

Figure 6 "is a flow diagram showing a process for encrypting content in accordance with an embodiment" of the '920 patent. *Id.* at 5:32–33. The '920 patent describes the process as follows:

> The process 90 includes encrypting (92) the content using "frame encryption keys". The "frame encryption keys" are then encrypted (94) using the "content encryption keys". The "content encryption key" is then encrypted (96) using the one or

more "user encryption key(s)", which enables for "user encryption key" revocation or retirement . . . and then digital rights specified with respect to the content by the content provider are then encrypted (98) using one or more "base encryption keys" appropriate to the class of device for which the playback certification is being issued. Again, the use of multiple "base encryption keys" allows for "base encryption key" revocation or retirement . . . . The resulting bundle of variously encrypted pieces of information are used to create the playback certification. The playback certification is incorporated (100) with the encrypted content to create a file for distribution to the user that requested the content.

Id. at 11:46–62.

The '920 patent describes the use of a server to provide a trusted system with information to generate one or more playback certifications. Ex. 1001, 12:16–19. In particular,

[t]he server provides the trusted system with a message 100 that includes a content message 102, a user message 104 and instructions 106 concerning the type(s) of playback certification to generate. The trusted system receives the message 100 and replies with a message 108 that contains the playback certification(s) 109. The content message 102 contains one or more content keys issued by the content provider with respect to a specific piece of content and access control that governs the operations that can be performed by a trusted system with respect to that piece of content (e.g., whether the trusted system is allowed to generate a playback certification, the types of playback certifications that are allowed for that content and/or whether the content is bound to a user or bound to a media). The user message 104 contains the "user encryption keys" for the specific user that is requesting the content as well as access control governing what operations the user authorizes the trusted system to perform . . . . The instructions 106 concerning the playback parameters of the playback certification . . . issued specify the manner in which a user can access the content.

Id. at 12:19–40.

The '920 patent also describes a process for accessing the content for playback after a file has been formed and provided to a playback device. In particular, process 120 includes "identifying (122) the active 'base encryption key' for the particular class of device that is attempting to access the content, which can be used to access information concerning the type of playback parameters supported by the playback certification." Ex. 1001, 13:50–57 (referring to Fig. 8). The active "user encryption key" is then used "to decrypt (124) the version of the 'content encryption key' that was encrypted by the active 'user encryption key'. The 'content encryption key' is then used to decrypt (126) the table of 'frame encryption keys' used in the technical protections of the content." *Id.* at 13:57–62. The '920 patent explains that "[t]he table of 'frame encryption keys' can then be used to playback (128) the content. Any decryption of the content typically occurs as the content is being viewed." *Id.* at 13:62–65.

F.   Illustrative Claims

Claims 1 and 10 are the independent claims challenged in this proceeding. Claims 1 and 10 are illustrative of the claimed subject matter and are reproduced below, with a modified version of Petitioner's bracketing added for reference:

> 1.   [1a] A method of decoding encrypted content using a play-back device on which an active user encryption key is stored, where the content includes frames of video and at least a portion of a plurality of frames of video are encrypted using at least one frame encryption key, [1b] and the at least one frame encryption key is encrypted using a content encryption key, and one or more copies of the content encryption key are each encrypted using one or more user encryption keys including the active user encryption key, the method comprising:

[1c] obtaining encrypted content using a playback device, where the content includes frames of video and at least a portion of a plurality of frames of video are encrypted using at least one frame encryption key;

[1d] obtaining using the playback device a copy of the at least one frame encryption key that is encrypted using a content encryption key and obtaining one or more copies of the content encryption key that are each encrypted using one or more user encryption keys including an active user encryption key stored on the playback device;

[1e] decrypting one of the one or more copies of the content encryption key using the playback device and the active user encryption key; and

[1f] playing back frames of the encrypted content using the playback device, where playing back frames of the encrypted content further comprises:

[1g] identifying any portions of a frame that are encrypted;

[1h] identifying the frame encryption key used to encrypt the identified portions of the frame;

[1i] decrypting the identified frame encryption key using the decrypted content encryption key;

[1j] decrypting the encrypted portions of the frame using the decrypted identified frame encryption key; and

[1k] decoding the unencrypted frame of video.

10.   [10a] A playback device configured to playback encrypted content, where the content includes frames of video and at least a portion of a plurality of frames of video are encrypted using at least one frame encryption key, [10b] and the at least one frame encryption key is encrypted using a content encryption key, and one or more copies of the content encryption key are encrypted using one or more user encryption keys including the active user encryption key, the playback device comprising:

[10c] memory comprising a playback application; and

a processor;

wherein the processor is configured by the playback application to:

[10d] obtain encrypted content, where the content includes frames of video and at least a portion of a plurality of frames of video are encrypted using at least one frame encryption key;

[10e] obtain a copy of the at least one frame encryption key that is encrypted using a content encryption key and obtaining one or more copies of the content encryption key that are each encrypted using one or more user encryption keys including an active user encryption key stored on the playback device;

[10f] decrypt one of the one or more copies of the content encryption key using the active user encryption key; and

[10g] play back frames of the encrypted content, where playing back frames of the encrypted content further comprises:

[10h] identifying any portions of a frame that are encrypted;

[10i] identifying the frame encryption key used to encrypt the identified portions of the frame;

[10j] decrypting the identified frame encryption key using the decrypted content encryption key;

[10k] decrypting the encrypted portions of the frame using the decrypted identified frame encryption key; and

[10l] decoding the unencrypted frame of video.

Ex. 1001, 16:49–17:14 (claim 1), 17:42–18:23 (claim 10).

G.   *Level of Ordinary Skill in the Art*

Petitioner, supported by the McDaniel Declaration, proposes that a person of ordinary skill in the art at the time of the invention would have had "a bachelor's degree in electrical engineering, computer science, or a similar field with at least two years of experience in video encryption and cryptography or . . . a master's degree in electrical engineering, computer science, or a similar field with a specialization in video encryption and cryptography." Pet. 14 (citing Ex. 1003 ¶¶ 65–67). Patent Owner does not address, expressly, the level of ordinary skill in the art in its Response. *See generally* PO Resp. Dr. Nielson, however, applies Petitioner's proposed level of ordinary skill in his Declaration (Ex. 2009 ¶ 34) and does not indicate that he does otherwise in his Second Declaration (*see generally* Ex. 2024).

In our Institution Decision, we found that Petitioner's proposal was consistent with the level of ordinary skill in the art reflected by the prior art of record and we preliminarily adopted Petitioner's unopposed position. Inst. Dec. 10 (citing *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978)). As neither party challenges our preliminary finding regarding the level of ordinary skill in the art, we see no reason to disturb that finding. Accordingly, we maintain and reaffirm that one of ordinary skill in the art at the time of the invention would have had "a bachelor's degree in electrical engineering, computer science, or a similar field with at least two years of experience in video encryption and cryptography or . . . a master's degree in electrical engineering, computer

science, or a similar field with a specialization in video encryption and cryptography." *See* Inst. Dec. 9–10 (finding the same).

II. CLAIM CONSTRUCTION

In this *inter partes* review, claims are construed using the same claim construction standard that would be used to construe the claims in a civil action under 35 U.S.C. § 282(b). *See* 37 C.F.R. § 42.100(b) (2019). The claim construction standard includes construing claims in accordance with the ordinary and customary meaning of such claims as understood by one of ordinary skill in the art at the time of the invention. *See id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc). In construing claims in accordance with their ordinary and customary meaning, we take into account the specification and prosecution history. *Phillips*, 415 F.3d at 1315–17.

If the specification "reveal[s] a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess[,] . . . the inventor's lexicography governs." *Phillips*, 415 F.3d at 1316 (citing *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002)). Another exception to the general rule that claims are given their ordinary and customary meaning is "when the patentee disavows the full scope of a claim term either in the specification or during prosecution." *Uship Intellectual Props., LLC v. United States*, 714 F.3d 1311, 1313 (Fed. Cir. 2013) (quoting *Thorner v. Sony Computer Entm't Am., LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012)).

Additionally, only terms that are in controversy need to be construed, and these need be construed only to the extent necessary to resolve the controversy. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795,

803 (Fed. Cir. 1999) (holding that "only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy"); *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs.* in the context of an *inter partes* review).

Petitioner does not present any specific claim terms for construction. Petitioner contends that "the challenged claims are invalid under their plain and ordinary ('P&O') meaning." Pet. 15 (citing Ex. 1003 ¶ 99). In the Preliminary Response, Patent Owner raised the meaning of two claim terms—"user encryption key" and "content encryption key." Prelim. Resp. 40–44, 46–48. In the Institution Decision, we addressed each term to the extent necessary to resolve the controversy presented, and we found, in each instance, that Petitioner's mapping of the prior art to these limitations of the claims was sufficient on the record presented at the time. *See* Inst. Dec. 12–15 (discussing the construction of the terms), 22–28 (discussing limitation 1[a], which includes "user encryption key"), 28–31 (discussing limitation 1[b], which includes "content encryption key"). In particular, on the preliminary record, we found that "Chen's master key Kw teaches the recited 'user encryption key'" (*id.* at 28) and "Chen's work key Kw teaches the recited 'content encryption key'" (*id.* at 30).

In the Response, Patent Owner does not propose a construction for any claim term or contest our preliminary findings regarding limitations 1[a] and 1[b]. *See generally* PO Resp. Accordingly, we maintain and reaffirm our preliminary determinations regarding the meaning of the recited "user encryption key" and "content encryption key." Dec. 12–15. Additionally,

we need not construe other claim terms to resolve the present controversy

before us.[6]

III.   ANALYSIS

A.   *Legal Standards – Obviousness*

The U.S. Supreme Court set forth the framework for applying the

statutory language of 35 U.S.C. § 103 in *Graham v. John Deere Co. of

Kansas City*, 383 U.S. 1, 17–18 (1966):

> Under § 103, the scope and content of the prior art are to be
> determined; differences between the prior art and the claims at
> issue are to be ascertained; and the level of ordinary skill in the
> pertinent art resolved. Against this background, the
> obviousness or nonobviousness of the subject matter is
> determined. Such secondary considerations as commercial
> success, long felt but unsolved needs, failure of others, etc.,
> might be utilized to give light to the circumstances surrounding
> the origin of the subject matter sought to be patented.

The Supreme Court explained in *KSR International Co. v. Teleflex Inc.* that

> [o]ften, it will be necessary for a court to look to interrelated
> teachings of multiple patents; the effects of demands known to
> the design community or present in the marketplace; and the
> background knowledge possessed by a person having ordinary
> skill in the art, all in order to determine whether there was an
> apparent reason to combine the known elements in the fashion
> claimed by the patent at issue. To facilitate review, this
> analysis should be made explicit.

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[6] Additionally, because Patent Owner does not assert, in the Response, that Petitioner failed to establish that the cited art teaches limitations 1[a] and 1[b], we find any argument directed to those issues waived. Paper 8 ("Scheduling Order"), 8 ("Patent Owner is cautioned that any arguments for patentability not raised in the response may be deemed waived."); Paper 16 ("Amended Scheduling Order"), 9 (same).

550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.")).

"Whether an ordinarily skilled artisan would have been motivated to modify the teachings of a reference is a question of fact." *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1327 (Fed. Cir. 2016) (citations omitted). "[W]here a party argues a skilled artisan would have been motivated to combine references, it must show the artisan 'would have had a reasonable expectation of success from doing so.'" *Arctic Cat Inc. v. Bombardier Recreational Prods. Inc.*, 876 F.3d 1350, 1360–61 (Fed. Cir. 2017) (quoting *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1068–69 (Fed. Cir. 2012)).

B.   Obviousness over Chen and Grab-333

Petitioner asserts that the combination of Chen and Grab-333 would have rendered the subject matter of claims 1 and 10 obvious to one of ordinary skill in the art at the time of the invention. Pet. 15–48. Patent Owner opposes. PO Resp. 1–29. Specifically, Patent Owner contends that Petitioner's proposed combination fails to teach limitations 1[c], 1[g], and 1[j] and that Petitioner fails to show a rationale to combine the teachings of Chen and Grab-333.[7] *Id.* For the reasons that follow, we find that Petitioner

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[7] Patent Owner's argument applies equally to Petitioner's analysis of the corresponding limitations of claim 10 and rationale to combine. *See* PO Resp. 2 n.1 (indicating that the same arguments apply to claim 10). Patent Owner, however, does not separately contest Petitioner's analysis of other claim limitations, e.g., limitations 1[a] and 1[b]. *See generally* PO Resp.

has not established, by a preponderance of the evidence, that the combination teaches or suggests limitations 1[c] and the corresponding limitation of claim 10, limitation 10[d]. Because these findings are dispositive, we focus our analysis and discussion there.

1. *Level of Ordinary Skill in the Art*

As discussed above, we adopt Petitioner's unopposed position as to the level of ordinary skill in the art. *See supra* § I.G.

2. *Scope and Content of the Prior Art*
a. *Chen*

Chen is directed to a "system and method for security key transmission with strong pairing to destination client." Ex. 1004, code (54). Chen explains that "implementation of fee-based video broadcasting requires a conventional conditional access (CA) system to prevent non-subscribers and unauthorized users from receiving signal broadcasts." *Id.* ¶ 3. "A complete CA system usually includes three main functions: a scrambling/descrambling function, an entitlement control function, and an entitlement management function." *Id.* ¶ 4. Chen explains that

> [t]he scrambling/descrambling function is designed to make the program incomprehensible to unauthorized receivers. Scrambling may be applied commonly or separately to the different elementary stream components of a program. For example, the video, audio and data stream components of a TV program may be scrambled in order to make these streams unintelligible. Scrambling may be achieved by applying various scrambling algorithms to the stream components. The scrambling algorithm usually utilizes a secret key, called a control word. Once the signal is received, the descrambling may be achieved by [a] receiver that holds the secret key or the

control word, used by the scrambling algorithm prior to
transmission.

Id.

Chen refers to the "rights and associated keys needed to descramble a
program" as "entitlements." Ex. 1004 ¶ 5. The entitlement control function
provides the conditions required to access a scrambled program as
"conditional access messages, called entitlement control messages (ECMs)."
Id. "The ECMs carry an encrypted form of the control words, or a means to
recover the control words, together with access parameters, such as
identification of service and of the conditions required for accessing this
service." *Id.*

Chen explains that "[t]here are several kinds of entitlements matching
the different means to 'buy' a video program. These entitlements are also
broadcasted as condition access messages, called entitlement management
messages (EMMs)." Ex. 1004 ¶ 6. "EMMs are used to convey entitlements
or keys to users, or to invalidate or delete entitlements or keys. The
entitlement control functions and the entitlement management functions
require the use of secret keys and cryptographic algorithms." *Id.*
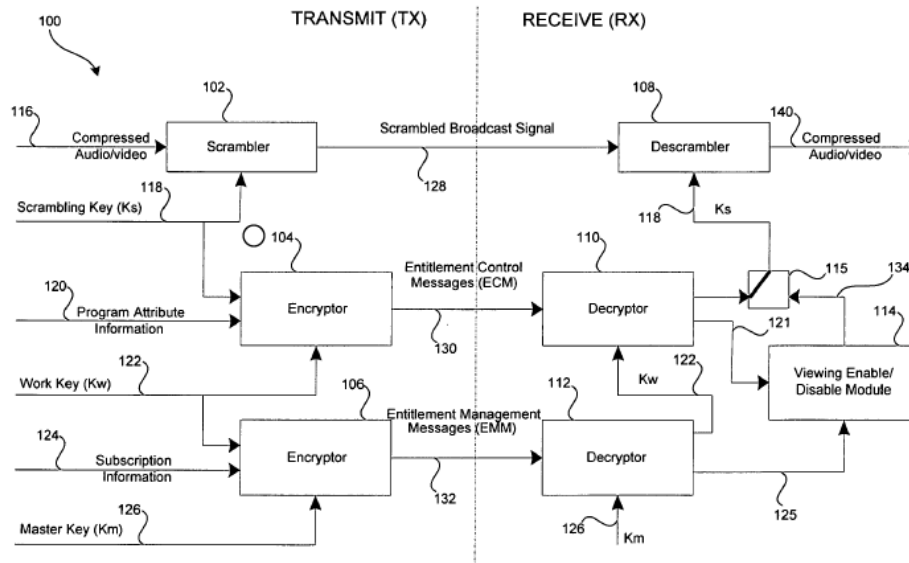
Chen's Figure 1 is reproduced below:

FIG. 1   (PRIOR ART)

Figure 1 is "a block diagram illustrating [a] conditional access system utilizing a conventional key ladder system." Ex. 1004 ¶ 26. Figure 1 shows conditional access system 100, including scrambler 102, descrambler 108, encryptors 104 and 106, decryptors 110 and 112, switch 115, and viewing enable/disable circuit 114. *Id.* ¶ 10. Chen explains the following regarding the transmit (TX) side of Figure 1:

> [T]he compressed audio/video signal 116 may be scrambled by the scrambler 102, utilizing a scrambling key Ks 118, in order to obtain a scrambled broadcast signal 128. Program attribute information 120 may be encrypted by the encryptor 104, utilizing a work key Kw 122, to obtain the entitlement control messages 130. Program subscription information 124 may be encrypted by the encryptor 106, utilizing a master key 126, to obtain the entitlement management messages 132.

Id.

Chen states that scrambling key Ks 118 determines the scrambling pattern and must be continuously transmitted to the subscriber's receiver

because it is often changed to maintain a secure system. Ex. 1004 ¶ 11. In Chen's CA system 100, encryptor 104 encrypts scrambling key 118, which is then transmitted within entitlement control messages 130. *Id.* ECM 130 also includes program attribute information 120, which can be used to determine whether a subscriber's subscription permits viewing a program. *Id.* ECM 130 is encrypted by encryptor 104 before transmission, using work key Kw 122. *Id.* Work key Kw 122 is sent to the receiver through entitlement management messages 132, with subscription information 124. *Id.*

Chen explains that "[p]rior to transmission, the EMM 132 is encrypted by a master key Km 126. A master key is unique to each receiver and its security must be commonly managed among different broadcast operators that use the same type of receiver." Ex. 1004 ¶ 12. Chen teaches that this is accomplished by setting up "an organization for uniform key management," which Chen describes as follows: "[T]he content scrambling key 118 is protected by the work key 122, which is in turn protected by the master key 126. This key protection 'chain' is, sometimes, referred to as a key ladder." *Id.*

> On the receive (RX) side of Figure 1, Chen explains that
>
> the same key ladder is utilized in order to decrypt the necessary secure keys and scrambled broadcast audio/video signals 128. The master key 126 may be utilized with the decryptor 112 in order to decrypt the EMM 132 and the work key 122. As a result, the work key 122 is obtained as one of the outputs from the decryptor 112. The decrypted work key 122 may then be utilized by the decryptor 110 to decrypt the ECM 130 and the scrambling key 118. As a result, the scrambling key 118 is obtained as one of the outputs from the decryptor 110. The decrypted scrambling key 118 may then be utilized by the

descrambler 108 to descramble the scrambled broadcast signal 128 and obtain the compressed audio/video output 140.

Access to the compressed audio/video output 140 by a user is determined in accordance with the user's subscription information 124 and the program attribute information 120. The decryptor 112 decrypts the EMM 132 to obtain decrypted Subscription information 125. The decryptor 110 decrypts the ECM 130 to obtain decrypted program attribute information 120. The viewing enable/disable module 114 receives the decrypted subscription information 125 and the decrypted program attribute information 121 and may then determine whether or not a user is entitled to receive the compressed audio/video output 140. If the user is entitled to receive the compressed audio/video output 140 (for example, the user has a valid subscription for a given programming channel), then the viewing enable/disable module 114 issues a control signal 134 activating the switch 115. Once the switch 115 is activated, this allows for the decrypted scrambling key 118 to be entered into the descrambler 108, which in turn allows for the descrambling of the compressed audio/video output 140.

Ex. 1004 ¶¶ 13–14.

b.   Grab-333

Grab-333 "is directed to a method and system for generating a protected stream of compressed digital video and for decrypting the protected stream in a bounded-bandwidth fashion." Ex. 1005 ¶ 2. Grab-333 explains that "modern video display devices are capable of displaying individual of [sic] dots of light, or 'pixels', of various colors. The term 'frame' has been employed to refer to a matrix of pixels at a given resolution." *Id.* ¶ 3. Grab-333 states that "[e]xisting digital video compression techniques are complex processes which rely upon a variety of techniques in transforming (i.e., 'encoding') a unit of uncompressed video data into an encoded form." *Id.* ¶ 5.
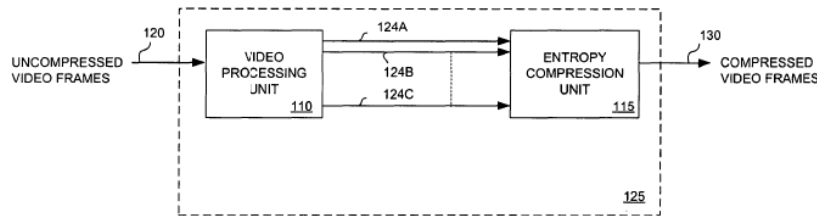
Figure 1 of Grab-333 is reproduced below:

FIG. 1

Figure 1 shows a block diagram of conventional digital video encoder 125.
Ex. 1005 ¶¶ 7, 21. "The digital video decoder 125 is comprised of a video
processing unit 110 and an entropy compression unit 115. Digital video
encoder 125 is configured to generate compressed video output by using
motion estimation and motion compensation to exploit temporal redundancy
in certain of the uncompressed video frames 120." *Id.* ¶ 7.

Grab-333's method for producing a protected stream of compressed
video content includes "receiving an input stream of compressed video
content containing a sequence of frames." Ex. 1005 ¶ 16. "A set of
encrypted frames are created by encrypting selected parts of selected frames
of the sequence of frames in accordance with a frame encryption function."
Id. Frame decryption information necessary to decrypt the set of encrypted
frames also is generated. *Id.* Grab-333 also describes a decrypting digital
decoder "including a video decryption module configured to receive a
protected input stream of compressed video content," which stream contains
"at least a set of encrypted frames and frame decryption information
necessary to create a set of decrypted frames through decryption of the set of
encrypted frames." *Id.* ¶ 19.

3.   *Differences Between the Prior Art and the Claims;*
       Motivation to Modify

As noted above, claims 1 and 10 are the independent claims challenged in this proceeding. Claim 1 is directed to a method of decoding encrypted content using a playback device including several steps, whereas claim 10 is directed to a playback device comprising, *inter alia*, a playback application and a processor, wherein the processor is configured by the playback application to perform essentially the same steps recited in claim 1. *See* Inst. Dec. 49; *compare* Ex. 1001, 16:49–17:15 (claim 1), *with id.* at 17:42–18:23 (claim 10); Pet. 44–48 (discussing claim 10 in relation to claim 1), PO Resp. 2 n.1 ("Claim 10 includes similar limitations as claim 1 . . . ."). Limitation 10[d] corresponds to limitation 1[c]. *See* Pet. 47. For the reasons explained below, we find that Petitioner has not established by a preponderance of the evidence that the combination of Chen and Grab-333 teaches or suggests limitation 1[c] and, for the same reasons, limitation 10[d]. Patent Owner argues limitations 1[c], 1[g], and 1[j] together, but because this issue is dispositive, we need not also address limitations 1[g] and 1[j]. Additionally, we do not address Patent Owner's arguments directed to whether one of ordinary skill in the art would have been motivated to combine the teachings of Chen and Grab-333 as proposed by Petitioner.

a.   *Independent Claim 1*

Limitation 1[c] recites "obtaining encrypted content using a playback device, where the content includes frames of video and at least a portion of a plurality of frames of video are encrypted using at least one frame encryption key." Ex. 1001, 16:58–61. Petitioner contends that the combination of Chen and Grab-333 teaches "obtaining the encrypted content

(e.g., 'scrambled broadcast signal') using a playback device, where the content includes frames of video and at least a portion of a plurality of frames of video (e.g., selected frames) are encrypted using at least one frame encryption key (e.g., scrambling key Ks/control word)." Pet. 31 (citing Ex. 1003 ¶¶ 119–122; Ex. 1004, Fig. 1). Patent Owner disagrees. *See, e.g.*, PO Resp. 14.

In our Institution Decision, we remarked that "Petitioner and Patent Owner offer competing declarant testimony regarding Chen's teachings, including the nature and composition of Chen's scrambled broadcast signal 128." Inst. Dec. 36. We acknowledged the difficulty in determining how one of ordinary skill in the art would have viewed Chen's teachings in light of the conflicting evidence presented by the parties. *Id.* at 36–37. We determined, on the record before us at that time, that "Patent Owner's declaration testimony creates a genuine issue of material fact regarding Chen's teachings." *Id.* at 37. And, applying 37 C.F.R. § 42.108(c) in its then-current form, we "view[ed] Patent Owner's testimonial evidence 'in the light most favorable to the petitioner solely for purposes of deciding whether to institute an *inter partes* review.'" *Id.* (quoting 37 C.F.R. § 42.108(c) (2016)) (citing Patent Trial and Appeal Board Consolidated Trial Practice Guide ("Consolidated TPG"), 50 (same)). In light of how we were required to consider the evidence, including Patent Owner's testimonial evidence, at the time of institution, we found that Petitioner established that the combined teachings of Chen and Grab-333 met limitation 1[c]. *Id.*

Following our Institution Decision, as discussed below, the parties' efforts have focused on providing, *inter alia*, additional explanation and examples of conditional access systems, broadcast signals, encryption

techniques, and standards in the industry regarding the same in an attempt to explain how one of ordinary skill in the art would have understood Chen at the time of the '920 patent. As discussed herein, the weight of the evidence is very closely balanced. Fundamentally, however, it is Petitioner's burden to establish how one of ordinary skill in the art would have understood Chen and the combined teachings of Chen and Grab-333. And, as we find herein based on the full record developed during trial, Petitioner does not establish that the combined teachings of Chen and Grab-333 would have met limitation 1[c]. Below, we walk through the parties' arguments and evidence, starting with the Petition, and then we discuss our findings regarding Chen in light of the full trial record.

Relying upon Chen's Figure 1, Petitioner contends that Chen teaches scrambling compressed audio/video signal 116 by scrambler 102, using scrambling keys Kw 118, to obtain scrambled broadcast signal 128. Pet. 32 (citing Ex. 1004 ¶¶ 4, 10, Fig. 1). Petitioner asserts that Chen's receive side, RX, obtains the scrambled broadcast signal. *Id.* (citing Ex. 1004 ¶¶ 4, 13, Fig. 1). Thus, Petitioner contends that "Chen teaches obtaining encrypted video content using a playback device." *Id.* (citing Ex. 1003 ¶ 120). Additionally, Petitioner argues that one of ordinary skill in the art would have understood that "digital video includes a series of frames," and, therefore, "[t]he encrypted content includes frames of video." *Id.* (citing Ex. 1003 ¶ 120; Ex. 1005 ¶¶ 3–4).

Petitioner contends that Grab-333 similarly teaches "obtaining encrypted content using a playback device (e.g., decrypting digital video decoder), where the content includes frames of video." Pet. 32 (citing Ex. 1003 ¶ 121); *see id.* (citing Ex. 1005 ¶¶ 19, 56, Figs. 8, 12). Petitioner

asserts that Grab-333 also teaches that "the encrypted content includes frames of video and at least a portion of a plurality of frames of video are encrypted using at least one frame encryption key." *Id.* at 32–33 (citing Ex. 1003 ¶ 122; Ex. 1005 ¶ 16, Figs. 5, 6, 8). Petitioner points to Figure 5 of Grab-333, contending that it shows "i-frame, p-frames and b-frames . . . with encrypted and unencrypted portions," *id.* at 33 (citing Ex. 1005 ¶¶ 35–37, Fig. 5; Ex. 1003 ¶ 122), and that Grab-333 explains that each frame encryption key "is used to encrypt a predefined number of frames," *id.* (citing Ex. 1005 ¶ 41, Figs. 5, 9). Petitioner asserts that "[i]t would have been obvious to apply Grab-333's frame encryption key teachings to Chen's scrambling key Ks/control word." *Id.* (referring to Petition § VI.A.2.1[a]).

Patent Owner contends that the proposed combination fails to teach limitation 1[c] because "no 'frames' exist at the receiving side of Petitioner's combination until ***after*** Chen's entire descrambling process is complete." PO Resp. 3. Patent Owner asserts, relying upon Dr. McDaniel's deposition testimony, that the combined teachings "use[] Grab-333's 'frame encryption key' at the point Chen's descrambling would ordinarily occur, with Fig. 11 of Grab-333 replacing Chen's scrambler (102) and Fig. 12 of Grab-333 replacing Chen's descrambler (108)." *Id.* (citing Ex. 2016 (McDaniel Deposition Transcript), 118:3–25). Thus, Patent Owner contends that "when frames are ultimately obtained after descrambling, they are not encrypted with the alleged 'frame encryption key' of either Chen or Grab-33." *Id.* Patent Owner asserts that even if it were possible for Chen to act upon frames, "no decryption could occur until after the method in claim 1 is complete," which fails to satisfy limitation 1[j], where decryption occurs with the frame encryption key. *Id.*

Patent Owner explains that broadcast systems, such as one using Chen's scrambled broadcast signal, are prone to transmission errors. PO Resp. 4 (citing Ex. 2016, 53:21–24). Therefore, commercial broadcasters relied upon packet-based transmission streams. *Id.* (citing Ex. 2024 ¶¶ 4–5; Ex. 2006, 3 (§ 1.3)). The most common broadcasting packet format in digital video broadcasting is MPEG-2. *Id.* at 4–5 (citing Ex. 2014, 68). Broadcasters use a packet format because loss or corruption of a packet has a much lower impact on quality than the loss of a frame if a broadcast system attempted to transmit data frame-by-frame. *Id.* at 5 (citing Ex. 2024 ¶ 5). In practice, an elementary stream, i.e., the bit stream created by the broadcaster, is broken up into variable-length packets, forming a "packetized elementary stream" (PES). *Id.* at 7 (citing Ex. 2005, 1; Ex. 2010, 399–400 (§ 4.4.5)). It is undisputed that a PES packet is equivalent to a video frame. *Id.* at 8 (citing Ex. 2006, 2 (§ 1.1)); Ex. 2024 ¶ 9; Pet. Reply 6 (citing Ex. 2024 ¶ 9; Ex. 1030, 33:10–33, 33:22–25; Ex. 2006 §§ 1.1, 1.3). Patent Owner asserts that Chen does not teach transmitting PES packets, rather "Chen transmits transport stream packets," and a transport stream packet is not a frame of video. PO Resp. 6.

In particular, Patent Owner contends that the PES is broken up into fixed-length packets, forming the transport stream (TS). PO Resp. 7 (citing Ex. 2004, 13–14 (§ 2.1), 119–20 (§ 9.2.1)). TS packets are 188 bytes long, usually smaller than PES packets, which helps lower the negative impact of packet loss because a smaller dropped packet results in less information lost than a larger dropped packet. *See id.* (citing Ex. 2004, 14 (§ 2.1); Ex. 2019, 18 (§ 2.4.3); Ex. 2020, 18 (§ 2.4.3)). Patent Owner acknowledges that scrambling can be applied to PES packets either before or after they are

broken into TS packets. *Id.* at 7 & n.3. But, Dr. Nielson's declaration testimony provides that "a transport stream packet is not equivalent to a frame in any way. Nor is there any 1:1 correspondence between TS packets and MPEG video frames." Ex. 2009 ¶ 68.

Patent Owner asserts that when the broadcast signal arrives at the descrambler in Chen, it does so as a transport stream. PO Resp. 9 (citing Ex. 2004, 119 (§ 9.2.1)). To recover frames on the receive side of Chen's Figure 1, Patent Owner contends that "the transport stream must be demultiplexed . . . with a demux processor, a distinct process from conditional access descrambling." *Id.* at 9–10 (citing Ex. 2004, 110 (§ 9.1), 120 (Fig. 9.6); Ex. 2014, 68–71). Thus, according to Patent Owner, "[a] frame cannot exist on the receiving side until it is recovered from multiple TS packets. And that, in turn, cannot happen until the scrambled TS packets are descrambled, and the relevant elementary stream is demultiplexed from the other elementary streams the transport stream carries." *Id.* at 10 (citing Ex. 2004, 12–13 (§ 2.0), 110 (§ 9.1); Ex. 2009 ¶ 75).

Additionally, Patent Owner contends that Chen "does not discuss demultiplexing the descrambled transport stream to extract audio/video" because "Chen's demultiplexing occurs *after* conditional access descrambling, and Chen is focused on the conditional access system." PO Resp. 11 (citing Ex. 2009 ¶ 74; Ex. 2004, 120 (Fig. 9.6)). As relevant to this proceeding, Patent Owner asserts that Chen's teachings end at descrambling; Chen does not disclose "how the descrambled transport stream is demultiplexed, decoded, or rendered" because "[t]hose further processes are outside the scope of Chen's invention and disclosure." *Id.* (citing Ex. 1004 ¶¶ 3–21). Thus, Patent Owner argues that "the conditional access

descrambler in Chen is not receiving or processing *frames* of encrypted

content." *Id.* at 12 (citing Ex. 2009 ¶¶ 72, 75, 80).

> Patent Owner contends that

> assuming any encrypted frames are ever obtained, those frames do not exist on Chen's receiving side until after Chen's descrambler receives a broadcast signal as TS packets, descrambles the TS packets with a scrambling key Ks/control word . . . , selects those packets from the demuxed TS that are relevant for the particular video stream, and outputs a descrambled, compressed audio/video signal 140 for further processing.

PO Resp. 14 (citing Ex. 2009 ¶¶ 85–88). Thus, Patent Owner asserts that

any frames obtained in Petitioner's proposed combination are not encrypted

or decrypted with Chen's scrambling key Ks/control word or Grab-333's

frame encryption key, *id.* at 12 (citing Ex. 2009 ¶¶ 84–89), and, therefore,

the combination cannot satisfy, *inter alia*, limitation 1[c], *id.* at 14 (citing

Ex. 2009 ¶ 89).

> In its Reply, Petitioner contends Patent Owner

> does not dispute that Chen teaches the alleged invention of a 3-level key hierarchy or that Grab-333 teaches partial encryption. Ground 1 combines these known techniques. Rather than address the references' express teachings, [Patent Owner] attempts to create incompatibilities where there are none, using sideshow collateral attacks to limit Chen's teachings to the particular implementations of *other CA references* and arguing details, such as networking or audio, that are mentioned nowhere in the challenged claims.

Pet. Reply 5. As rebuttal, Petitioner offers several examples of "CA systems

performing partial encryption of video frames." *Id.* Petitioner's argument

focuses on how one of ordinary skill in the art would have understood Chen

as well as whether one of ordinary skill in the art would have combined the teachings of Chen and Grab-333. *See, e.g., id.*

As noted above, we focus on Petitioner's arguments directed to Chen because we find this issue dispositive.[8] To the extent possible, we group and address Petitioner's and Patent Owner's arguments and evidence directed to the same issue before moving to the next.

1) Chen's Scrambling Elementary Stream Components

Petitioner first points to Chen's statement that "[s]crambling may be applied commonly or ***separately to the different elementary stream components*** of a program . . . ." and that "[a] CA system is also flexible as it may be exercised on an ***elementary stream***-by-stream basis . . . ." Pet. Reply 5–6 (quoting Ex. 1004 ¶¶ 4, 8) (citing Ex. 1003 ¶ 114; Ex. 2016, 14:8–15, 42:9–16). Petitioner contends, "[t]herefore[,] Chen expressly teaches scrambling the video [elementary stream] separate from other components such as audio." *Id.* at 6 (citing Ex. 1032 ¶ 5). Petitioner asserts that "[i]t is undisputed that video elementary streams include frames and are not packetized." *Id.* (citing Pet. 24; PO Resp. 10; Ex. 2009 ¶¶ 68, 75; Ex. 1032 ¶ 4). Because claim 1 is directed to a method of *decoding* encrypted content, Petitioner argues that "[s]ince Chen teaches encrypting the video [elementary stream], it would have been obvious that Chen also teaches decrypting the video [elementary stream] because, as a basic networking principle, functionality applied at one layer in the transmitter is

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[8] Petitioner relies upon the Nielson Declaration and Neilson Reply Declaration throughout its Reply, and we have considered his testimony in full as reflected herein.

applied at the same layer at the receiver." *Id.* (citing Ex. 1032 ¶ 9). Petitioner contends that Dr. Nielson admitted that video frames may be encrypted even after being packetized into a PES and Patent Owner's exhibit shows PES (i.e., frames) being scrambled *before* they are split into TS packets. *Id.* at 6–7 (citing Ex. 1030, 35:14–17, 47:12–48:4, 82:4–6; Ex. 2008 §§ 5.3, 5.4 (Fig. 1); Ex. 1032 ¶¶ 6–8).

In its Sur-reply, Patent Owner repeats its primary argument that Chen's broadcast signal is received as TS packets containing parts of frames that are input to Chen's descrambler 108 and, therefore, no frame is obtained by the receiver in Chen/Grab-333 until after descrambling sufficient packets to reconstitute a frame. PO Sur-reply 2. At that point, according to Patent Owner, the frame is *not* encrypted with the alleged frame encryption key and the key ladder has been exhausted. *Id.* Patent Owner also points to Chen's description that decryption is performed in the "transport core." *Id.* (citing Ex. 1004 ¶ 79; Ex. 2031, 135:20–136:1).

In response to Petitioner's position regarding Chen's teaching of scrambling the video elementary stream, Patent Owner contends that TS packets are elementary stream components. PO Sur-reply 2–3 (citing PO Resp. 9 (reproducing Ex. 2004, 13)). Patent Owner asserts that, even if Chen does not teach TS-level *encryption*, Chen's *decryption* is always at the TS level. *Id.* at 3. Patent Owner relies upon Dr. Nielson's declaration testimony and the digital video broadcasting (DVB) standard. *Id.* at 3–4 (citing Ex. 2024 ¶ 7 (citing Ex. 2008, 9); PO Resp. 7 n.3). Thus, according to Patent Owner and Dr. Nielson, "'scrambling on the PES level is actually treated just like TS scrambling.' The result is that, whether scrambling

occurs at the frame (PES) or TS level, *de*scrambling occurs at the TS level."
Id. at 4 (citing Ex. 2024 ¶¶ 7–8 (citing Ex. 2011, 341 (§ 2.12.7.1))).

Fundamentally, Petitioner's analysis is based not on a specific
teaching in Chen but rather, the absence of teachings. Chen describes
Figure 1 as "prior art" (see the description under the figure) and, thus, the
bulk of Chen's description builds from Figure 1 to describe what Chen
considers to be its invention—a system and method for security key
transmission with strong pairing to a destination client. Ex. 1004, code (54);
see id. ¶ 22 ("Certain embodiments of the invention may be found in a
system and method for security key transmission with strong pairing to
destination client."). Chen presents "scrambled broadcast signal 128" in
Figure 1, explaining that the figure "is a block diagram illustrating a
conditional access system utilizing a conventional key ladder system." *Id.*
¶ 10. Chen explains that the configuration of CA system 100 in Figure 1
"has been recommended by International Telecommunications Union–
Radiocommunication Sector (ITU-R)." *Id.* Chen states that "[s]crambling
may be applied commonly or separately to the different elementary stream
components of a program. For example, the video, audio and data stream
components of a TV program may be scrambled in order to make these
streams unintelligible." *Id.* ¶ 4. The different components referred to are
clearly those of "video, audio and data stream," as Chen states. *Id.* But, as
the parties acknowledge, Chen does not provide any details as to how those
components are scrambled, whether commonly or separately. Rather, Chen
acknowledges that scrambling may be achieved by applying a known
scrambling algorithm to the stream components, but, beyond that, Chen does
not explain how the scrambling is performed. *Id.*

Fundamentally, even if we agree with Petitioner that Chen broadly teaches scrambling the video elementary stream, the examples provided by Petitioner do not persuade us by a preponderance of the evidence that one of ordinary skill in the art would have understood Chen differently than as proposed by Patent Owner. At best, we find the evidence equally balanced as to Chen's disclosure.

As a result, we do not find it more probable that one of ordinary skill in the art would have understood Chen's CA system to operate as Petitioner proposes. Rather, we find it, at least equally probable, that Chen's CA system operates as Patent Owner proposes, which results in exhaustion of the key ladder before frames are reassembled on the receiving side of Chen's Figure 1. In other words, we find equally persuasive Patent Owner's argument that whether we look at the elementary stream, the PES, or the TS, one of ordinary skill in the art would have understood the descrambling, on the receive side of Chen's Figure 1, to take place at the TS level in light of the DVB standard. *See, e.g.*, Ex. 2024 ¶¶ 7–8. And, even though, as discussed further herein, one of ordinary skill in the art would have recognized that frames are transmitted in the TS in Chen's system, we find that Petitioner has not established by a preponderance of the evidence that frames are obtained before they are reassembled after descrambling.

Second, Petitioner contends that Patent Owner admits that an elementary stream and PES include video frames, which is why Patent Owner attempts to limit Chen to scrambling the next layer—TS packets. Pet. Reply 7. Fundamental to Petitioner's position is its argument that

> Chen never mentions "transport" streams or "packets." Instead, Chen teaches scrambling elementary streams, which [Patent Owner] ignores. A [person of ordinary skill in the art] would

have known how to apply Chen's teachings with or without TS
packets—Chen leaves those networking details to the [person
of ordinary skill in the art].

Id. (citing Ex. 1032 ¶¶ 10–13; Ex. 1030, 32:15–18). Petitioner asserts that
Chen should not be limited to TS packets because although some CA
systems used TS packets, others did not. *Id.*

As an example of a CA system not using TS packets, Petitioner
provides Exhibit 1018, which the parties refer to as "Candelore-666."[9] Pet.
Reply 7. Specifically, Petitioner points to Figures 19F and 19G of
Candelore-666, "where 'each stream of A/V content is ***not configured in
accordance with MPEG transport requirements. Rather, each stream is a
program stream of Packetized Elementary Stream (PES) packets*.'" *Id.*
(quoting Ex. 1018 ¶ 151). Petitioner contends those figures illustrate A/V
content sent as a collection of PES packets in IP (Internet Protocol)
datagrams. *Id.* at 7–8 (citing Ex. 1018 ¶ 161, Figs. 19F, 19G).

Petitioner contends, "Candelore-666 teaches that CA systems may
transmit video frames (PES packets) inside IP datagrams *without dividing
them into TS packets*, using known networking techniques, and 'A/V content
associated with the PES packets is recovered at the tuner/demodulator . . . .'"
Pet. Reply 8 (quoting Ex. 1018 ¶ 151). Petitioner asserts that the IP protocol
was well known by 2006 and one of ordinary skill in the art would have
recognized that video could be delivered over the Internet using TCP/IP,
"which provides a reliable, lossless, sequential connection." *Id.* (citing
Ex. 1018 ¶¶ 30, 163; Ex. 1032 ¶ 12).

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[9] U.S. Patent Application Publication No. US 2004/0181666A1, published
Sept. 16, 2004 ("Candelore-666").

Additionally, Petitioner contends that Patent Owner's focus on Exhibit 2004 ("Massel"), which shows one CA system, is too narrow because not all CA systems work in the same way. Pet. Reply 9–11. In particular, Petitioner asserts that Figure 18 of Candelore-666 teaches that a CA set-top box can demultiplex TS packets into separate audio and video component streams *before* any decryption/decoding. *Id.* at 9–10 (citing Ex. 1018 ¶ 28, Fig. 18 (showing "PACKET SORTER (PID DEMUX)" upstream of DECRYPT 1028 and MPEG VIDEO DECODER 1036); Ex. 1032 ¶ 16). Petitioner argues that Chen's CA system is more similar to Figure 18 of Candelore-666 than Massel's CA system. *Id.* Comparing Figure 9.7 from Massel to Figure 1 of Chen, Petitioner asserts that Massel shows "ECM/EMM passing through the descrambler, whereas Chen's ECM/EMM do not" pass through a descrambler, which suggests that Chen's demultiplexing happens *before* descrambling. *Id.* at 9 (citing Ex. 1032 ¶¶ 14–15; comparing Ex. 2004, Fig. 9.7, with Ex. 1004 ¶ 18, Fig. 1). Petitioner contends Chen teaches "encrypting/decrypting elementary stream components 'separately'" and that one of ordinary skill in the art "would have known how to implement this—e.g., by demultiplexing packets before the decryption/decoding process." *Id.* at 10 (quoting Ex. 1004 ¶ 4) (citing Ex. 1032 ¶¶ 17–19).

Stated succinctly, Petitioner's argument is that "[d]ifferent CA implementations were known in the art" and "[i]t would be wrong to limit Chen's broad teachings to any single implementation, particularly when it differs from Chen's express teachings." Pet. Reply 11 (citing Ex. 1032 ¶¶ 18, 62; Ex. 1030, 40:19–41:24, 43:9–18, 43:19–44:3). And, according to Petitioner, statements in Patent Owner's exhibits further support the finding

that one of ordinary skill in the art would have understood that CA systems could be implemented in different ways. *Id.* at 11 n.3 (quoting Ex. 2004, 122 ("[T]he CA system can be (a) *a totally proprietary system* or (b) based on a common standard such as the DES or DVB descramblers."); Ex. 2014 § 4.3 ("It is *undesirable for the CA system to be standardized* . . . a plurality of CA systems may be adopted . . . .")) (citing Ex. 1032 ¶ 62).

In its Sur-reply, Patent Owner contends that Figures 19F and 19G of Candelore-666 are directed to internet transmission as opposed to broadcast transmission, and, thus, they are distinct from Chen's broadcast signal shown in Figure 1. PO Sur-reply 5–6. In other words, Patent Owner asserts that one of ordinary skill in the art would not have understood Chen's broadcast signal to include internet transmission, via IP datagrams.[10]

Additionally, Patent Owner asserts that Figure 18 of Candelore-666 supports Patent Owner's understanding of Chen's Figure 1.[11] PO Sur-reply 7–9.[12] Patent Owner contends that Figure 18 shows a "new" set-top box that sorts and decrypts the same type of packets as "legacy" set-top

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[10] Patent Owner also asserts that Candelore-666 does not refer to CA when discussing Figures 19F and 19G. PO Sur-reply 6. We need not decide whether one of ordinary skill in the art would have understood Candelore-666 to apply a CA system to Figures 19F and 19G because our focus here is whether one of ordinary skill in the art would have understood Chen's broadcast signal to include Candelore-666's internet transmission via IP datagrams.

[11] Patent Owner notes that the first eighteen figures of Candelore-666 are directed to a different problem than Figures 19A-19E. PO Sur-reply 8.

[12] Our discussion herein does not rely upon the first paragraph of page 7 of Patent Owner's Sur-reply. As discussed *infra*, we have not considered this portion of Patent Owner's Sur-reply because the argument is based solely on evidence impermissibly filed with Patent Owner's Sur-reply. *See infra* § III.D.

boxes because it receives the same broadcast. *Id.* at 8–9 (citing Ex. 1018
¶¶ 130–150).

We find that one of ordinary skill in the art would not have
understood Chen's broadcast signal to teach or suggest an internet
transmission via IP datagram. In particular, Petitioner's evidence supports
our finding because broadcast systems are susceptible to packet loss and
transmission errors, whereas internet transmission was understood to be
reliable and lossless. *Compare* Ex. 2016, 53:21–24 (Dr. McDaniel testifying
that streams that use packets in broadcast systems are susceptible to packet
loss and transmission errors), *with* Pet. Reply 8 (delivering video over the
Internet using TCP/IP provides a reliable, lossless, sequential connection);
see Ex. 1005 ¶ 5 (explaining that "[e]ncoding techniques which enable
recovery of an identical version of the original data are characterized as
'lossless', while those that yield only visually similar versions are
categorized as 'lossy'"). Accordingly, Petitioner's argument and evidence
does not persuade us that one of ordinary skill in the art would have
understood that Chen's broadcast signal in Figure 1 encompasses the type of
internet transmission taught in Candelore-666's Figures 19G and 19F.[13]

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[13] Patent Owner also argues that Chen's description of "broadcast" could not
have encompassed Candelore-666's Internet embodiments because
Candelore-666 was published after Chen was filed. PO Sur-reply 6 n.2.
Fundamentally, Patent Owner does not contest that Chen and Candelore-666
are prior art to the '920 patent. Our focus is on how one of ordinary skill in
the art would have understood the references as of the date of the '920 patent
invention, not as of the date of Chen or Candelore-666 and not whether the
inventor of Chen knew of Candelore-666's disclosures or vice versa. Thus,
Patent Owner's argument based on the timing of the publication and filing of
Chen and Candelore-666 is not persuasive.

Additionally, even if we accept Petitioner's argument that the system shown in Chen's Figure 1 might have been understood to operate similarly to Candelore-666's Figure 18, by demultiplexing *before* descrambling, we fail to see how that shows descrambling anything other than at the TS level. Fundamentally, whether Chen's system operates as contended by Dr. Neilson and Patent Owner, relying in part on Massel (Exhibit 2004), or by Dr. McDaniel and Petitioner, relying in part on Figure 18 of Candelore-666, Petitioner has not persuaded us by a preponderance of the evidence that one of ordinary skill in the art would have understood that Chen teaches frames are obtained on the receive side of Figure 1 prior to descrambling.

Further, to the extent Petitioner relies upon other proprietary systems not discussed in detail, we fail to see how such general reliance teaches or suggests the specific operations recited by the claims. *See* Pet. Reply 11 n.3 (citing Ex. 2004, 122 ("[T]he CA system can be (a) *a totally proprietary system* or . . . .") (first alteration by Petitioner)). Additionally, we do not find Petitioner's argument based on other CA systems persuasive. It is not sufficient to essentially argue that anything is possible when we are focused on the details and description of the references presented by Petitioner in its asserted challenge.

2) Bodily Incorporation Arguments

Petitioner contends that Patent Owner seeks to limit Chen to the particular hardware descramblers of commercial CA set-top boxes and to limit Chen to the teachings of other CA references, such as Massel. Pet. Reply 11–12. Petitioner contends that Patent Owner's attempts to do so are based on improper bodily incorporation arguments. *Id.* Rather, Petitioner asserts that "Chen never mentions packets or TS" and "Chen is not limited to

the networking implementation of Massel or other references." *Id.* at 12–13. Petitioner argues that "[n]etworking and packetization were basic tools, long known in the art, which a [person of ordinary skill in the art] knew how to apply to the combination of Chen and Grab-333" and that "includes but does not require TS packets." *Id.* at 13 (citing Ex. 1032 ¶¶ 10–20, 28–38, 45). Petitioner asserts that the Challenged Claims do not recite any networking or packet limitations and Patent Owner's "attempt to inject networking and packetization into this proceeding is precisely the type of bodily incorporation argument the Federal Circuit has rejected." *Id.* (citing *Packers Plus Energy Servs. Inc. v. Baker Hughes Oilfield Operations, LLC*, 773 F. App'x 1083, 1089 (Fed. Cir. 2019); *Smith & Nephew, Inc. v. Rea*, 721 F.3d 1371, 1381 (Fed. Cir. 2013)).

In its Sur-reply, as pertains to Chen's disclosure, Patent Owner asserts that "Petitioner invites error, urging that Chen be read to encompass numerous undisclosed modifications—though *not*, ironically, TS-level processing." PO Sur-reply 10 (citing Pet. Reply 11–13). And, that "Petitioner's apparent premise is that by *disclosing almost nothing* regarding Fig. 1, Chen somehow *supplies broad disclosure*." *Id.* (citing Pet. Reply 11–13).

Our focus is what Chen teaches or suggests to one of ordinary skill in the art. We do not find Patent Owner's arguments directed to that inquiry, as discussed above, based on impermissible bodily incorporation. Chen is silent with respect to "frames," including when frames are obtained on the receive side of Figure 1. We see nothing improper with respect to Patent Owner's reliance upon declaration and documentary evidence explaining how one of ordinary skill in the art would have understood Chen. In the full

trial record, both parties have offered additional evidence in support of their contentions. *See, e.g.*, Exs. 1018, 1020[14] (filed with Petitioner's Reply).

Petitioner contends that Chen does not mention TS or packets and thus should not be limited to the networking implementation of Massel or other references offered by Patent Owner. Pet. Reply 12–13. But, Chen does not mention frames either. And, it is Petitioner's burden to establish whether Chen teaches or suggests the subject matter of the Challenged Claims—subject matter which expressly recites frames. Thus, Patent Owner's reliance upon other evidence to fill Chen's silence appears reasonable and understandable.

3) Frames in the TS

Petitioner contends that "[e]ven if Chen were limited to TS packets, [Patent Owner's] arguments would still fail because they rely on the faulty premise that video frames do not exist in the TS." Pet. Reply 13 (citing PO Resp. 8–10; Ex. 2009 ¶¶ 72–75; Ex. 1030, 37:14–38:13). Petitioner asserts that TS packets include information in headers and payloads, and the prior art shows that one of ordinary skill in the art can use that information to identify video frames in the TS. *Id.* at 13–14 (citing Ex. 1032 ¶¶ 20–21). As examples, Petitioner points to Candelore-666 and Candelore-010. In particular, Petitioner identifies teachings in Candelore-666 that discuss, *inter alia*, encrypting "start of frame" transport stream packets containing PES headers, *id.* at 14 (citing Ex. 1018 ¶ 86), and encrypting only I frames within a stream of TS packets, *id.* (citing Ex. 1018 ¶¶ 79–81, 90). And, Petitioner relies upon Candelore-010 as teaching that portions of video frames can be

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[14] U.S. Patent No. 8,452,010 B2, issued May 28, 2013 (Ex. 1020, "Candelore-010").

encrypted either before or after packetization. *Id.* (referring to § I.D.1 of the Reply[15]) (citing Ex. 1032 ¶¶ 24–25).

Petitioner contends the prior art discussed above indicates that one of ordinary skill in the art "knew how to scramble and descramble video frames inside a TS packet stream based on indicators in TS packet headers and payloads." Pet. Reply 14–15 (citing Ex. 1018 ¶ 86). Petitioner asserts that a TS packet is a portion of a frame and that video frames exist inside the TS. *Id.* at 15 (citing Ex. 1030, 34:2–7). Fundamental to Petitioner's position is its argument that "[f]rames do not disappear when packaged into TS packets; the frames exist in packet payloads, and the prior art confirms that [persons of ordinary skill in the art] knew how to encrypt/decrypt select portions of frames inside TS packets." *Id.* (footnote omitted) (citing Ex. 1032 ¶¶ 24–25).[16]

In its Sur-reply, Patent Owner contends that its argument is not that frames do not exist in the TS; rather, it is that "in Chen/Grab-333, *no encrypted frame is ever obtained or decrypted.*" PO Sur-reply 11. Patent Owner asserts that Petitioner's reliance upon Candelore-666 is "yet another untimely obviousness theory: replacing Grab-333's encryption/decryption with Candelore-666's teachings."[17] *Id.* Patent Owner argues that, even

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[15] Although there is no § I.D.1 of the Reply, we understand Petitioner to refer to § I.D.

[16] Petitioner notes that "Candelore-666 focuses on encryption" and because decryption follows the inverse process, Candelore-666's teachings regarding partial encryption of video frames also encompass the inverse process of decrypting those portions of video frames. Pet. Reply 15 n.6.

[17] Patent Owner asserts that this is a new theory proposed in Petitioner's Reply because "Candelore-666 teaches different encryption than Grab-333: while Grab-333 encrypts/decrypts at the frame level (Ex. 1007, Fig[s]. 6, 8),

considering Petitioner's citations to Candelore-666, those citations establish that Candelore-666 uses TS-level scrambling. *Id.* (citing Pet. Reply 14). Thus, Patent Owner contends that "by the time 'frames' are 'obtained' in Chen/Candelore-666 after descrambling, those frames, too, are unencrypted." *Id.* at 12.

We do not agree that Petitioner's reliance upon Candelore-666 is a new theory of obviousness. Rather, we understand that Petitioner generally relies upon Candelore-666 to contest Patent Owner's reliance upon Massel and other references describing features of broadcast transmission in CA systems. And, we agree that frames exist in the TS. Evidence relied upon by both parties confirms this. In particular, the evidence provided by Petitioner, as discussed above, establishes that one of ordinary skill in the art can recognize where different portions of frames are located in the TS. And, the evidence provided by both parties establishes that frames exist on the transmit side of Chen's Figure 1 and that in order to be displayed on the receive side of Chen's Figure 1, frames must exist there as well. Thus, in general, the transmission sequence of frames broken down to TS packets and then reconstituted as frames suggests that frames exist in the TS because Chen's system could not otherwise reconstitute them on the receive side. Accordingly, we accept and recognize that frames exist in the TS. The issue, as Patent Owner explains, however, is whether Chen teaches or suggests obtaining encrypted content where the content includes frames of video. And, for the reasons discussed above and below, Petitioner has not established by a preponderance of the evidence that Chen so teaches or

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'Candelore-666 teaches partial encryption of video frames in the TS.'" PO Sur-reply 11 (citing Pet. Reply 14).

suggests because Petitioner has not established that Chen's receive side obtains frames where at least a portion of a plurality of them are encrypted using at least one frame encryption key. [18]

4) Petitioner's Examples

Under the heading "Actual POSITAs combined CA systems with partial frame encryption," Petitioner contends that Patent Owner's evidence "confirms that '*elementary streams or parts thereof* may be scrambled for conditional access.'" Pet. Reply 15 (quoting Ex. 2019, 41 (§ 2.4.4)). Petitioner asserts the prior art provided several examples, including proprietary systems and Internet applications, where persons of ordinary skill in the art partially encrypted video frames in CA systems, "providing express teaching, suggestion, and motivation to combine Chen's CA teachings (for distributing keys) with Grab-333's teachings (for partially encrypting frames)." *Id.* at 15–16 (citing Ex. 1032 ¶ 27; Ex. 1018 ¶¶ 30, 163; Ex. 1006 ¶ 21).

Petitioner points to Candelore-010 as teaching encrypting selected portions of video frames in CA set-top boxes. Pet. Reply 16–20 (citing, *inter alia*, Ex. 1020, 3:9–16, 8:54–58, 8:65, 9:17, 9:36, 9:52–67, 10:7–22, 13:38–42, Figs. 6–10; Ex. 1032 ¶¶ 28–32). Petitioner also points to Grab-333 as

> teach[ing] mechanisms that allow precise control allowing encryption to be applied to selected portions of the video frame, including by location and size, which a [person of ordinary skill in the art] knew how to use to configure encryption based on

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[18] We also recognize that neither party asserts that a TS packet is a frame. *See* Pet. Reply 15 ("A TS packet is a portion of a frame." (citing Ex. 1030, 34:2–7)); *see* Tr. 49:10 (Patent Owner's counsel reiterating that "a TS is not a frame.").

TS packet boundaries, as known in the art and illustrated by
Candelore-010.

Id. at 20 (citing Ex. 1032 ¶ 33; Ex. 1005 ¶¶ 38, 40, 45). And, Petitioner

points to Kocher as "teach[ing] CA systems scrambling video frames,

teaching that 'MPEG "I" frames could be encrypted, while other

communications could be unencrypted.'" *Id.* (quoting Ex. 1007, 116:3–18).

In its Sur-reply, Patent Owner addresses Petitioner's reliance on

Candelore-666, Candelore-010, and Kocher, contending that Petitioner uses

these references as new, improper reasoning to combine Chen and Grab-333,

and that these arguments represent a new obviousness theory. PO Sur-

reply 12. Patent Owner contests Petitioner's reliance upon these additional

references and also demonstrates that each suffers from a similar deficiency

because no encrypted frames are obtained on the receiving side as claimed.

See id. at 14.

To the extent Petitioner's argument is directed to whether one of

ordinary skill in the art would have been motivated "to combine Chen's CA

teachings (for distributing keys) with Grab-333's teachings (for partially

encrypting frames)" (Pet. Reply 15; *see id.* at 15–16 (discussing motivation

to combine)), this argument does not speak to whether one of ordinary skill

in the art would have understood Chen to teach or suggest obtaining

encrypted frames—the issue to which we have focused this discussion.

Above, we accepted that Petitioner's evidence indicates that one of ordinary

skill in the art, based on, e.g., Candelore-010, would have understood how to

encrypt portions of frames in CA set-top boxes. *See, e.g.*, Pet. Reply 18–20

(citing, *inter alia*, Ex. 1032 ¶¶ 28–30, Ex. 1020, Figs. 6–10). The issue,

however, as reiterated above, is how one of ordinary skill in the art would

have understood Chen. And, for the same reasons, this argument and

evidence by Petitioner does not establish sufficiently (i.e., by a preponderance of the evidence) that one of ordinary skill in the art would have understood Chen to obtain encrypted frames as recited in the Challenged Claims.

5) Frame-by-Frame Transmission

Petitioner contends that frame-by-frame transmission is not required by the Challenged Claims or the combination of Chen and Grab-333. Pet. Reply 21. Petitioner asserts that "Chen does not limit its teachings to particular transmission mechanisms, and a [person of ordinary skill in the art] would have implemented Chen (and the combination of Chen and Grab-333), using known transmission techniques, which includes but does not require TS packets, TCP/IP, or other protocols." *Id.* (citing Ex. 1032 ¶ 39). In particular, Petitioner asserts that Chen's Figure 1 is a "conceptual 'block diagram,' not a schematic," and just because it does not illustrate the transmission details, that does not mean they are missing, it simply means known mechanisms are applied, "for example with packetization between the scrambler and descrambler." *Id.* at 21–22 (citing Ex. 1032 ¶ 40; Ex. 1020, 13:38–42). And, Petitioner contends it was common for such details to be omitted in certain diagrams, which suggests those elements were known in the art. *Id.* at 22 (citing Ex. 1032 ¶¶ 41–42; Ex. 1021, Fig. 1.7; Ex. 1001, Figs. 2, 5, 7; *Uber Techs., Inc. v. X One, Inc.*, 957 F.3d 1334, 1339 (Fed. Cir. 2020); *In re Epstein*, 32 F.3d 1559, 1568 (Fed. Cir. 1994)).

In its Sur-reply, Patent Owner agrees that the Challenged Claims do not require frame-by-frame transmission. PO Sur-reply 16. Nonetheless, Patent Owner asserts that if "Petitioner contends it would have been obvious

to replace Chen's *broadcast* with *Internet transmission* within a CA system, that argument is untimely and wrong." *Id.*

We agree with the parties that the Challenged Claims do not require frame-by-frame transmission. We also agree with Petitioner that Chen's Figure 1 omits details about the transmission. For the reasons discussed above, however, Petitioner has not shown by a preponderance of the evidence that one of ordinary skill in the art would have filled in the omissions in Chen with the evidence needed to support a finding that Chen teaches or suggests obtaining encrypted frames as required by the Challenged Claims.

6) Summary re Claim 1

For the reasons explained above, Petitioner has not established by a preponderance of the evidence that the combination of Chen and Grab-333 teaches or suggests limitation 1[c], "obtaining encrypted content using a playback device, where the content includes frames of video and at least a portion of a plurality of frames of video are encrypted using at least one frame encryption key."[19]

b. Independent Claim 10

Independent claim 10 is directed to a playback device, *inter alia*, comprising memory comprising a playback application and a processor, wherein the processor is configured by the playback application to perform essentially the same steps recited in independent claim 1. Ex. 1001, 17:42–

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[19] In reaching our decision on each claim and ground, we disregarded certain sections of Patent Owner's Sur-reply that inappropriately rely on new exhibits filed with the Sur-reply (*see* Papers 35, 38), discussed further below.

18:23. Petitioner equates the following limitations of claims 1 and 10 as set forth below:

Claim 10	Claim 1
10[a]	1[a]
10[b]	1[b]
10[d]	1[c]
10[e]	1[d]
10[f]	1[e]
10[g]	1[f]
10[h]	1[g]
10[i]	1[h]
10[j]	1[i]
10[k]	1[j]
10[l]	1[k]

Pet. 44–45, 47–48.

Limitation 10[d] recites "obtain encrypted content, where the content includes frames of video and at least a portion of a plurality of frames of video are encrypted using at least one frame encryption key." Ex. 1001, 18:1–4. As reflected in the chart above, in addressing limitation 10[d], Petitioner relies upon its arguments and evidence directed to limitation 1[c]. Pet. 47 (referring to limitation 1[c], Petition § VI.A.2.1[c], and Ex. 1003 ¶ 141). Also, as noted above, Patent Owner's arguments directed to limitation 1[c] apply equally to limitation 10[d]. PO Resp. 2 n.1 ("Claim 10 includes similar limitations as claim 1 in the context of a device claim and is patentable for at least the same reasons as those given for claim 1.").

We agree with the parties that the arguments directed to limitation 1[c] are also applicable to limitation 10[d]. Accordingly, for the same reasons discussed above regarding limitation 1[c], Petitioner has not shown by a preponderance of the evidence that the combination of Chen and Grab-333 teaches or suggests limitation 10[d].

C. *Obviousness over Chen, Grab-333, and Candelore; Obviousness over Chen, Grab-333, and Kocher*

Petitioner contends that the combined teachings of Chen, Grab-333, and Candelore would have rendered the subject matter of claims 1–3 and 10–12 obvious to one of ordinary skill in the art at the time of the invention. Pet. 48–61. Additionally, Petitioner contends that the combined teachings of Chen, Grab-333, and Kocher would have rendered the subject matter of claims 1, 3, 5, 6, 10, 12, 14, and 15 obvious to one of ordinary skill in the art at the time of the invention. *Id.* at 61–80. In each ground, however, Petitioner relies solely upon Chen and Grab-333 (and not Candelore or Kocher) for limitations 1[c] and 10[d]. *See id.* at 54 ("As discussed above for Ground 1, the combined teachings of Chen and Grab-333 render limitations 1[b] to 1[k] obvious; the addition of Candelore does not alter this analysis." (citing Pet. §§ VI.A.2.1[b]–VI.A.2.1[k]; Ex. 1003 ¶¶ 161–170)), 60 ("As discussed above for Ground 1, the combined teachings of Chen and Grab-333 renders limitations 10[d] to 10[l] obvious; the addition of Candelore does not alter this analysis." (citing Pet. §§ VI.A.3.10[d]– VI.A.3.10[l]; Ex. 1003 ¶¶ 180–188)), 65 ("The combination of Chen and Grab-333 render[s] Claim 1 obvious; the addition of Kocher does not alter this analysis." (citing Pet. § VI.A.2)), 79 ("As discussed above for Ground 1, the combined teachings of Chen and Grab-333 renders limitations 10[d] to

10[l] obvious; the addition of Kocher does not alter this analysis." (citing Pet. §§ VI.A.3.10[d]–VI.A.3.10[l]; Ex. 1003 ¶¶ 220–228)). And, in the discussion of each dependent claim under each ground, Petitioner maintains reliance upon the same proposed combination of Chen and Grab-333 to address the limitations of the independent claim from which each dependent claim depends. *See, e.g., id.* at 54 (referring to Petitioner's argument directed to claim 1 to address claim 2's dependency from claim 1). Patent Owner recognizes that the Petition relies upon the arguments and evidence raised for ground 1 when addressing grounds 2 and 3. *See* PO Resp. 30 ("Because the challenges are the same in both grounds, the challenge to these independent claims in Ground 2 is inadequate for same reasons as in Section II." (which addresses ground 1)), 37 ("Because the challenges are the same in both, the challenge to these independent claims in Ground 3 is inadequate for the same reasons in Section II.").

Accordingly, for the same reasons discussed above regarding limitations 1[c] and 10[d] in the context of Ground 1, Petitioner has not shown by a preponderance of the evidence that the combined teachings of Chen, Grab-333, and Candelore would have rendered the subject matter of claims 1–3 and 10–12 obvious or that the combined teachings of Chen, Grab-333, and Kocher would have rendered the subject matter of claims 1, 3, 5, 6, 10, 12, 14, and 15 obvious to one of ordinary skill in the art at the time of the invention.

D.   *Petitioner's Motion to Exclude*

Petitioner filed a motion to exclude Exhibits 2004–2006, 2008, 2010, 2011, 2014, 2015, 2017–2023, 2025, and 2028–2030.[20] Mot. 1. Patent Owner responds more specifically to Petitioner's arguments, but generally argues that Petitioner's motion fails to exclude any of Dr. Nielson's testimony, which is based on many of the exhibits. Opp. 1. In Reply, Petitioner asserts that "[t]hese exhibits are inadmissible under the F.R.E. Whether Dr. Nielson cited to them does not change their inadmissibility." Reply 1.

Petitioner, as the "moving party," "has the burden of proof to establish that it is entitled to the requested relief." 37 C.F.R. § 42.20.

1.   *Exhibits 2004–2006, 2008, 2010, 2011, 2014, 2015, and 2017–2023*

Petitioner contends that Exhibits 2004–2006, 2008, 2010, 2011, 2014, 2015, and 2017–2023 should be excluded because they (1) have not been authenticated (Mot. 2–3, 6–8 (citing Fed. R. Evid. 901(a))), (2) contain inadmissible hearsay and lack relevance (*id.* at 3–5 (citing Fed. R. Evid. 801(c), 802)), and (3) contain improper opinions (*id.* at 5 (citing Fed. R. Evid. 602, 701)).

In Opposition, Patent Owner first responds that Petitioner has not cast doubt on the validity or authenticity of the disputed exhibits. Opp. 2 (citing *Pass & Seymour, Inc. v. Hubbell, Inc.*, 532 F. Supp. 2d 418, 438 (N.D.N.Y.

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[20] Petitioner includes Exhibit 2012 in its initial listing of exhibits challenged in its Motion (Mot. 1), but does not discuss the substance of the exhibit in the Motion or the Reply. To the extent Exhibit 2012 was intended to be included, Petitioner's Motion is *denied* with respect thereto since Petitioner does not address the exhibit and therefore does not carry its burden of proof.

2007)); *see id.* at 6–7. Patent Owner asserts that Exhibits 2004, 2005, 2010, and 2011 are authenticated because of distinctive, circumstantial evidence under Federal Rule of Evidence 901(b)(4), specifically copyright dates, publisher information, International Standard Book Numbers (ISBNs), and a trade inscription. *Id.* at 3. Patent Owner contends Exhibits 2006 and 2008 are self-authenticating pursuant to Federal Rules of Evidence 902(6) and 902(5), respectively. *Id.* at 3–4. And, Patent Owner asserts that the Smith Declaration (Ex. 2026), produced as supplemental evidence, supports the authenticity of Exhibits 2014, 2015, and 2017–2023. *Id.* at 8–10.

Second, Patent Owner contends that Exhibits 2004–2006, 2008, 2010, 2011, 2014, 2015, and 2017–2023 are "publicly available printed publications," the substance of which are not hearsay. Opp. 6 (citations omitted), 10. And, Patent Owner asserts that these exhibits "rebut[] Petitioner's own alleged evidence of how CA systems work." *Id.* at 7.

Third, Patent Owner contends that Federal Rules of Evidence 602 and 701 do not apply to these exhibits because the exhibits are not opinion or witness testimony. Opp. 7–8, 10.

In Reply, Petitioner contends the exhibits are not authenticated because there is no evidence the documents "are actual, *published* documents *from the 2006 timeframe*." Reply 1. Petitioner asserts Patent Owner "did not submit *any* evidence—not even a declaration stating who downloaded these exhibits, from where." *Id.* Thus, Petitioner contends Patent Owner "failed to produce evidence 'that the item is what the proponent claims it is.'" *Id.* (quoting Fed. R. Evid. 901(a)). Additionally, Petitioner contends Patent Owner did not submit any evidence about where Exhibits 2008 and 2010 were found (a requirement of Federal Rule of

Evidence 901(b)(8)(B)), contradicting Patent Owner's argument that these exhibits qualify as ancient documents. *Id.* Petitioner further contends that Ms. Smith does not testify to the date or circumstances of publication for any of the exhibits and thus "does not show the exhibits to be publicly available printed publications in 2006." *Id.* at 2.

Further, Petitioner contends that Patent Owner's arguments regarding hearsay "rely on an unproven assumption that these documents were publicly available by 2006, despite making no effort to prove this." Reply 1. Petitioner asserts that the case law, on which Patent Owner relies, shows that "prior art" is not hearsay because prior art demonstrates the knowledge of a person of ordinary skill in the art, as opposed to necessarily being offered for the truth. *Id.* But, according to Petitioner, the critical difference here is that the exhibits at issue have not been shown to be prior art; "[t]here is no evidence about whether or when any of these PDFs were publicly available." *Id.* Additionally, Petitioner contends that Patent Owner cannot rely on the dates listed in the documents, as that would also be hearsay. *Id.* Further, even if considering the dates listed, Petitioner asserts that Exhibits 2004– 2006 list dates from 2008–2016, which are after the 2006 priority date of the '920 patent. *Id.*

As discussed briefly above, Petitioner does not challenge Dr. Nielson's testimony based on these exhibits. Nor does Petitioner argue that it was unreasonable for Dr. Nielson to rely upon these exhibits, even if the exhibits are inadmissible. Thus, even if we were to exclude the exhibits, Dr. Nielson's testimony thereon is still before us for consideration. *See Wi-Lan Inc. v. Sharp Elects. Corp.*, 992 F.3d 1366, 1375–76 (Fed. Cir. 2021) (discussing admissibility of expert testimony based on inadmissible

evidence). As discussed in our substantive analysis of the case, our focus with respect to these exhibits is based on Dr. Nielson's testimony. And, Petitioner does not assert that (a) an expert would not reasonably rely to some extent on the exhibits challenged, even if dated after the 2006 priority date of the '920 patent, or (b) that the challenged exhibits disclose information not available to one of ordinary skill in the art as of 2006. Although we do not rely on each of the challenged exhibits, we do rely upon Dr. Nielson's testimony. Therefore, for our purposes, there is no substantive difference whether we exclude the exhibits and consider Dr. Nielson's testimony as compared to whether we do not exclude the exhibits while considering Dr. Nielson's testimony. Accordingly, because Dr. Nielson's testimony is unchallenged, Petitioner's motion to exclude the exhibits upon which he relies—Exhibits 2004–2006, 2008, 2010, 2011, 2014, 2015, and 2017–2023—is dismissed as moot.

2. *Exhibits 2025 and 2028–2030*

Petitioner moves to exclude Exhibits 2025 and 2028–2030, *inter alia*, pursuant to 37 C.F.R. § 42.64(b) because Patent Owner filed those exhibits with its Sur-reply, which Petitioner contends violates 37 C.F.R. § 42.23(b). Mot. 10.

Patent Owner raises several arguments in response. First, Patent Owner contends that these exhibits are governed by 37 C.F.R. § 42.64(a) as "deposition evidence" and Petitioner did not (a) object to the admissibility of the exhibits during the second deposition of Dr. McDaniel and (b) object under Rule 42.64(a). Opp. 11. Thus, Patent Owner argues that Petitioner did not timely object to the admissibility of these exhibits. *Id.*

Second, Patent Owner asserts that these exhibits should not be excluded because they were introduced and used in the cross-examination of Dr. McDaniel during his second deposition. Opp. 11–12. Patent Owner contends that the exhibits and deposition testimony are cited several times in the Sur-reply and it is in the interests of justice to maintain the exhibits to have a complete record of the proceeding. *Id.* at 12.

Third, Patent Owner contends that if the discussion of these exhibits in the Sur-reply is considered improper, Petitioner has not explained why the exhibits could not "simply be ignored rather than excluded." Opp. 12; *see also id.* at 12–13 (arguing to maintain the exhibits in the record because they were used during Dr. McDaniel's second deposition).

In Reply, Petitioner contends that Patent Owner "conflates two issues"—(1) "whether evidence is admissible under the Federal Rules of Evidence versus [(2)] whether it is allowed by the PTAB's rules." Reply 2. Petitioner asserts that Rule 42.64(a) applies to evidentiary objections that can be cured, whereas there is no cure for Rule 42.23(b). *Id.* In other words, Petitioner contends that "[i]t does not matter if the evidence would otherwise be admissible under the [Federal Rules of Evidence]—new evidence is not allowed on sur-reply." *Id.* Additionally, Petitioner asserts that the exhibits are not helpful to provide context for Dr. McDaniel's testimony because his testimony was that he had not seen the exhibits and was not familiar with them. *Id.* Petitioner contends that Patent Owner "showed the new exhibits to Dr. McDaniel in a clear attempt at circumventing the PTAB's prohibition against new sur-reply evidence and arguments." *Id.* at 3. And, that "[a]llowing new sur-reply evidence would prejudice Petitioner." *Id.*

To begin, 37 C.F.R. § 42.23(b) specifies, in relevant part, that "[a] sur-reply may only respond to arguments raised in the corresponding reply and may not be accompanied by new evidence other than deposition transcripts of the cross-examination of any reply witness." 37 C.F.R. § 42.23(b). The Consolidated TPG repeats the above-quoted language of the rule and also explains that

> [s]ur-replies should only respond to arguments made in reply briefs, comment on reply declaration testimony, or point to cross-examination testimony. As noted above, a sur-reply may address the institution decision if necessary to respond to the petitioner's reply. This sur-reply practice essentially replaces the previous practice of filing observations on cross-examination testimony.

Consolidated TPG at 73–74. Accordingly, Rule 42.23(b) provides a blanket prohibition on a patentee filing exhibits with a sur-reply, as Patent Owner has done here.

The next question for us, as presented by Patent Owner's arguments, is whether Petitioner was required to object to the exhibits under 37 C.F.R. § 42.64(a) during Dr. McDaniel's second deposition. Rule 42.64 delineates between two types of evidence—"Deposition evidence" and "Other evidence." Objections to the admissibility of deposition evidence must be made during the deposition. 37 C.F.R. § 42.64(a). Notably, the Rule further states that "[e]vidence to cure the objection must be provided during the deposition, unless the parties to the deposition stipulate otherwise on the deposition record." *Id.* Objections to the admissibility of other evidence (i.e., evidence other than deposition evidence) after trial has been instituted must be filed within five business days of service of the evidence to which the objection is directed. 37 C.F.R. § 42.64(b)(1). And, the Rule provides

that "[a] party relying on evidence to which an objection is timely served may respond to the objection by serving supplemental evidence . . . ." 37 C.F.R. § 42.64(b)(2).

In light of the procedures set forth above and the facts presented here, it would not make sense to require Petitioner to raise an objection under Rule 42.23(b) during Dr. McDaniel's second deposition. Specifically, this portion of Rule 42.23(b) specifies what evidence may and may not accompany a sur-reply. Dr. McDaniel's second deposition was held on February 24, 2021 (Ex. 2031, 1), and Patent Owner filed the exhibits with its Sur-reply on March 17, 2021. To find as Patent Owner requests, Petitioner would be required to object to Patent Owner filing the exhibits before Patent Owner actually filed the exhibits. That would not make sense. Accordingly, we determine that Petitioner was not required to object to Patent Owner's filing *before* Patent Owner filed. Thus, the objection was not waived.

Additionally, we do not find it in the interests of justice to maintain these exhibits in the case file. We disagree that the exhibits provide context for Dr. McDaniel's deposition testimony because Dr. McDaniel repeatedly testified that he had not seen the exhibits. *See, e.g.*, Ex. 2031, 169:24–170:7 (testifying that he had not seen Exhibit 2025 before). Even though Petitioner filed additional exhibits with its Reply along with a declaration from Dr. McDaniel, Patent Owner had an opportunity to respond (with its Sur-reply) and depose Dr. McDaniel (which Patent Owner did). In contrast, Petitioner does not have an opportunity to respond to new evidence provided with Patent Owner's Sur-reply.

Further, we have not considered the portions of Patent Owner's Sur-reply on pages 7 and 18–20 that rely upon these exhibits, as identified in

Paper 35 (Petitioner's Identification of Improper New Evidence and Arguments in Sur-Reply). *See, e.g.*, *supra* § I.A.

Accordingly, we grant Petitioner's Motion to Exclude with respect to Exhibits 2025 and 2028–2030 pursuant to 37 C.F.R. § 42.23(b).[21]

IV.   SUMMARY

For the reasons discussed above, Petitioner has not demonstrated, by a preponderance of the evidence, that claims 1–3, 5, 6, 10–12, 14, 15 are unpatentable. Additionally, we grant in part Petitioner's Motion to Exclude and exclude Exhibits 2025 and 2028–2030, as described above, and dismiss as moot Petitioner's Motion to Exclude as directed to Exhibits 2004–2006, 2008, 2010, 2011, 2014, 2015, and 2017–2023.

Our conclusions regarding the Challenged Claims are summarized below:

Claims Challenged	35 U.S.C. §	Reference(s) /Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 10	103(a)	Chen, Grab-333		1, 10
1–3, 10–12	103(a)	Chen, Grab-333, Candelore		1–3, 10–12
1, 3, 5, 6, 10, 12, 14, 15	103(a)	Chen, Grab-333, Kocher		1, 3, 5, 6, 10, 12, 14, 15
Overall Outcome				1–3, 5, 6, 10–12, 14, 15

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[21] In light of our determination, we need not also decide whether these exhibits (a) are properly authenticated, (b) contain inadmissible hearsay, or (c) contain improper judicial opinions. *See* Mot. 10–14.

V.   ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–3, 5, 6, 10–12, 14, and 15 of U.S. Patent

No. 9,184,920 B2 are not determined to be unpatentable;

FURTHER ORDERED that Petitioner's Motion to Exclude

(Paper 36) is granted in part and Exhibits 2025 and 2028–2030 are excluded

and dismissed in part with respect to Exhibits 2004–2006, 2008, 2010, 2011,

2014, 2015, and 2017–2023; and

FURTHER ORDERED that, because this a Final Written Decision,

parties to this proceeding seeking judicial review of this Decision must

comply with the notice and service requirements of 37 C.F.R. § 90.2.

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