

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HULU, LLC,
Petitioner,

v.

DIVX, LLC,
Patent Owner.

IPR2021-01419
Patent 10,257,443 B2

Before BART A. GERSTENBLITH, MONICA S. ULLAGADDI, and
IFTIKHAR AHMED, *Administrative Patent Judges*.

GERSTENBLITH, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. Background

Hulu, LLC (“Petitioner”) filed a Petition (Paper 4, “Pet.”) requesting institution of *inter partes* review of claims 1, 2, 4, 7, 8, 10, and 13–16 (“the Challenged Claims”) of U.S. Patent No. 10,257,443 B2 (Ex. 1101, “the ’443 patent”).¹ DivX, LLC (“Patent Owner”) filed a Preliminary Response (Paper 8, “Prelim. Resp.”).

At Petitioner’s request, a conference call was held on January 7, 2022, a transcript of which is included in the record. *See* Ex. 1132 (Transcript of Proceedings, Jan. 7, 2022). During the conference call, the parties were authorized to file additional briefing pertaining to two issues—(1) the application of 35 U.S.C. § 325(d) and (2) prosecution history disclaimer. *See id.* at 27:9–31:22. Thereafter, Petitioner filed a Preliminary Reply (Paper 10, “Prelim. Reply”) and Patent Owner filed a Preliminary Sur-reply (Paper 12, “Prelim. Sur-reply”).

An *inter partes* review may be instituted only if “the information presented in the petition . . . and any [preliminary] response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2018). For the reasons below, Petitioner has not established a reasonable

¹ This Petition is Petitioner’s second petition challenging claims 1, 2, 4, 7, 8, 10, and 13–16 of the ’443 patent. As noted below, Petitioner also filed a petition challenging the same claims of the ’443 patent in IPR2021-01418. Petitioner filed a Ranking and Explanation of Material Differences Between Petitions (Paper 3), where Petitioner discusses the two petitions. Because of the determination we reach on the merits, we do not address the parties’ arguments as to whether two petitions are necessary.

likelihood that it would prevail in showing the unpatentability of at least one of the Challenged Claims. Accordingly, we do not institute an *inter partes* review of the Challenged Claims.

B. Related Proceedings

The parties indicate that the '443 patent is asserted in *DivX, LLC v. Hulu, LLC*, 2-21-cv-01615 (C.D. Cal.). Pet. 2; Paper 6 (Patent Owner's Mandatory Notices), 1. Petitioner indicates that the '443 patent is related to U.S. Patent No. 8,472,792 ("the '792 patent"), which is asserted in *DivX, LLC v. Hulu, LLC*, 2-19-cv-01606 (C.D. Cal.), and *DivX, LLC v. Netflix, Inc.*, 2-19-cv-01602 (C.D. Cal.). Pet. 2. Additionally, Petitioner explains that Netflix and Hulu filed a petition challenging claims of the '792 patent in IPR2020-00646. *Id.* Further, Patent Owner notes that Petitioner also challenges claims of the '443 patent in IPR2021-01418. Paper 6, 1.

C. Real Parties in Interest

Petitioner identifies Hulu, LLC and The Walt Disney Company as real parties in interest. Pet. 2. Patent Owner identifies DivX, LLC and DivX CF Investors LLC as real parties in interest. Paper 6, 1.

D. The Asserted Grounds of Unpatentability and Declaration Evidence

Petitioner challenges the patentability of claims 1, 2, 4, 7, 8, 10, and 13–16 of the '443 patent on the following grounds:

Claim(s) Challenged	35 U.S.C. §²	Reference(s)/Basis
1, 2, 4, 7, 8, 10, 13–16	103(a)	Notoya, ³ Matsui, ⁴ Candelore-I, ⁵ Candelore-II ⁶
4, 10, 16	103(a)	Notoya, Matsui, Candelore-I, Candelore-II, Mowry ⁷

Pet. 4–5. Petitioner supports its challenge with a Declaration of Dr. James A. Storer (Ex. 1102) and a Declaration of Dr. Sylvia Hall-Ellis (Ex. 1127). Patent Owner supports its arguments with a Declaration of Professor Chandrajit Bajaj, Ph.D. (Ex. 2002).

² The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the '443 patent has an effective filing date before March 16, 2013, we apply the pre-AIA version of the statutory basis for unpatentability.

³ WO 03/092285 A1, published Nov. 6, 2003 (Ex. 1104, “Notoya”). Exhibit 1104 includes a translator certification, an English-language translation of the reference, and the original Japanese-language version of the reference. Citations herein are to the English-language translation.

⁴ WO 03/101114 A1, published Dec. 4, 2003 (Ex. 1107, “Matsui”).

⁵ U.S. Patent Application Publication No. 2003/0133570 A1, published July 17, 2003 (Ex. 1105, “Candelore-I”).

⁶ U.S. Patent Application Publication No. 2004/0049694 A1, published Mar. 11, 2004 (Ex. 1106, “Candelore-II”).

⁷ U.S. Patent Application Publication No. 2004/0253942 A1, published Dec. 16, 2004 (Ex. 1108, “Mowry”).

E. The '443 Patent

The '443 patent is directed to a “multimedia distribution system for multimedia files with interleaved media chunks of varying types.” Ex. 1101, code (54) (capitalization altered). The '443 patent explains that the described multimedia files include “a series of encoded video frames and encoded meta data about the multimedia file.” *Id.* at 7:64–65. The multimedia files also “can include digital rights management” that “can be used in video on demand applications.” *Id.* at 27:19–22. “Multimedia files that are protected by digital rights management can only be played back correctly on a player that has been granted the specific right of playback.” *Id.* at 27:22–24.

The '443 patent explains that “[m]ultimedia files in accordance with embodiments of the present invention can be structured to be compliant with the Resource Interchange File Format (‘RIFF file format’) RIFF is a file format for storing multimedia data and associated information.” Ex. 1101, 12:57–63. “A RIFF file typically has an 8-byte RIFF header, which identifies the file and provides the residual length of the file after the header (i.e. file_length-8). The entire remainder of the RIFF file comprises ‘chunks’ and ‘lists.’” *Id.* at 12:63–67.

The '443 patent states that “[a] ‘movi’ list chunk of a multimedia file” can include “information enabling digital rights management.” Ex. 1101, 27:32–36. A “‘movi’ list chunk” can include “a ‘DRM’ chunk” prior to each video chunk, where “[t]he ‘DRM chunks’ . . . are ‘data’ chunks that contain digital rights management information” *Id.* at 27:36–41. “A device attempting to play the digital rights management protected video track uses the information in the ‘DRM’ chunk to decode the video

information in the ‘video’ chunk.” *Id.* at 27:46–49. The ’443 patent explains that, in an embodiment, “the video chunks are only partially encrypted” and “the ‘DRM’ chunks contain a reference to the portion of a ‘video’ chunk that is encrypted and a reference to the key that can be used to decrypt the encrypted portion.” *Id.* at 27:53–58.

Figure 2.9 is reproduced below:

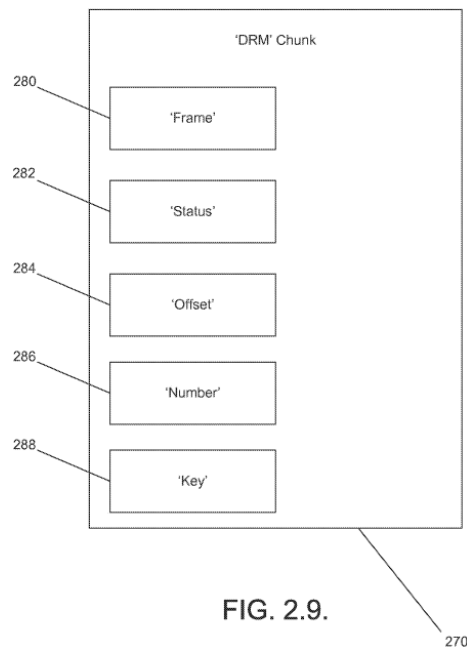


Figure 2.9 of the ’443 patent “is a conceptual diagram of the ‘DRM’ chunk.” Ex. 1101, 11:27–28. The ’443 patent explains the following regarding DRM chunk 270:

The “DRM” chunk 270 can include a “frame” value 280, a “status” value 282, an “offset” value 284, a “number” value 286 and a “key” value 288. The “frame” value can be used to reference the encrypted frame of video. The “status” value can be used to indicate whether the frame is encrypted, the “offset” value 284 points to the start of the encrypted block within the frame and the “number” value 286 indicates the number of encrypted bytes in the block. The “key” value 288 references the decryption key that can be used to decrypt the block.

Id. at 27:64–28:6.

F. Illustrative Claim

Claims 1 and 7 are the independent claims challenged in this proceeding. Claim 1 is illustrative of the claimed subject matter and is reproduced below with Petitioner's bracketing added for reference:

1. [1a] A system for decoding multimedia files comprising:
[1b] at least one processor;
[1c] a non-volatile storage containing a decoder application;

wherein the decoder application causes the at least one processor to perform the steps of:

[1d] receiving at least a portion of a multimedia file, wherein:

[1e] the received at least a portion of the multimedia file comprises at least one video track encoded as a plurality of video chunks, [1f] a set of digital rights management (DRM) chunks, and [1g] an index chunk;

[1h] at least one video chunk of the plurality of video chunks contains at least one partially encrypted frame of video so that only a portion of the encoded frame is encrypted;

[1i] each DRM chunk of the set of DRM chunks comprises DRM information to decrypt at least one partially encrypted frame of video in at least one video chunk of the plurality of video chunks;

[1j] the DRM information comprises an offset value that points to the start of an encrypted block within an encoded frame and a number value that indicates the number of encrypted bytes in the encrypted block;

[1k] the index chunk includes information concerning the location of data chunks within the

multimedia file including the locations of video chunks from the at least one video track; and

[11] for each chunk of the plurality of video chunks:

determining whether the video chunk contains at least one partially encrypted frame of video;

[1m] when a video chunk contains a partially encrypted frame of video, identifying a corresponding one of the set of DRM chunks that contains the DRM information for the partially encrypted frame of video, [1n] demultiplexing the partially encrypted frame from the video chunk, and [1o] decrypting the partially encrypted frame of video using the offset and number values from the DRM information for the partially encrypted frame of video; and

[1p] decoding at least one encoded frame of video for display.

Ex. 1101, 55:51–56:25.

G. Level of Ordinary Skill in the Art

Petitioner, supported by Dr. Storer’s testimony, proposes that a person of ordinary skill in the art at the time of the invention would have had (1) “a Bachelor’s Degree in computer science or a related field with at least three years of experience designing, developing, and implementing systems for streaming encoded and encrypted video multimedia files” or (2) “a Master’s Degree or Ph.D. in computer science or a related field with a specialization in designing, developing, and implementing systems for streaming encoded and encrypted video multimedia files.” Pet. 16 (citing Ex. 1102 ¶ 76).

Patent Owner does not express a position on the level of ordinary skill in the art in the Preliminary Response. *See generally* Prelim. Resp.

Dr. Bajaj, however, testifies that he disagrees with Dr. Storer’s definition of the level of ordinary skill because the definition “exceeds the qualifications of a person of ordinary skill in the art.” Ex. 2002 ¶ 25. Nonetheless, Dr. Bajaj does not propose a specific level of ordinary skill in the art and states that, for purposes of his declaration, he applies Dr. Storer’s definition of the level of ordinary skill in the art. *Id.*

At this stage of the proceeding, we find Petitioner’s proposal consistent with the level of ordinary skill in the art reflected by the ’443 patent and the prior art of record. *See 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). Therefore, we adopt and apply Petitioner’s position as to the level of ordinary skill in the art in our consideration of the issues presently before us.

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) (2021). 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 propose any claim terms for construction, noting that “because the challenged claims are invalid under any reasonable construction consistent with their plain meaning, claim construction is unnecessary.” Pet. 16. In the context of construing the “offset value” recitation of limitations [1j] and [7j], Patent Owner contends that the “offset value” cannot be relative to a file and instead must be relative to a frame. *See, e.g.*, Prelim. Resp. 41 (“the claimed ‘offset value’ must disclose a value that points to a location relative to the encoded frame, and not ‘relative to a file’”). Accordingly, we consider the meaning of “an offset value that points

to the start of an encrypted block within an encoded frame” as recited in limitations [1j] and [7j].

A. “an offset value that points to the start of an encrypted block within an encoded frame”

Claim 1, reproduced above, recites a system for *decoding* multimedia files wherein a portion of a multimedia file comprises DRM information that “comprises an offset value that points to the start of an encrypted block within an encoded frame.” Ex. 1101, 55:51–56:25 (limitation [1j]).

Independent claim 7 recites a system for *encoding* multimedia files that encodes DRM information as a set of DRM chunks wherein the DRM information “comprises an offset value that points to the start of an encrypted block within an encoded frame.” *Id.* at 56:41–57:10 (limitation [7j]); *see* Pet. 72 (identifying limitation [7j]).

During prosecution of the ’443 patent, the Examiner rejected the then-pending claims based, in part, on the patent that issued from the published patent application that we refer to as Candelore-II. *See, e.g.*, Ex. 1103, 259 (Final Rejection, dated May 16, 2019, referring to “US Patent #7,120,250 to Candelore”).⁸ In response to the Examiner’s rejection, the applicants amended the claims to include the “offset value” limitation. *See, e.g., id.* at 241 (amending then-pending claim 1), 244 (amending then-pending claim 9). Additionally, the applicants argued that Candelore-II failed to teach the subject matter of the amended claims. *Id.* at 249–52.

First, the applicants asserted that “[a]s an initial observation, the Candelore patent describes a variety of approaches for identifying segments

⁸ Exhibit 1103 is the prosecution history of the ’443 patent.

of video or portions of a file to encrypt.” Ex. 1103, 250. The applicants then stated that “[t]he Candelore patent does not, however, appear to disclose partial encryption of encoded frames of video by encrypting at least one block of data within the partially encrypted frame so that only a portion of the encoded frame is encrypted.” *Id.* In so doing, the applicants acknowledged that Candelore-II discloses encrypting “packets based upon the content of the packet,” “portions of unencoded frames of video,” “encoded frames,” and “structures within encoded frames that are identified by partially decoding the frames.” *Id.* (citing Candelore, 3:35–60⁹).

Second, the applicants argued the following:

The failure of the Candelore patent to teach partial encryption of encoded frames of video by encrypting at least one block of data within the partially encrypted frame so that only a portion of the frame [is encrypted and] is highlighted by the Candelore patent’s failure to disclose DRM information including “an offset value that points to the start of an encrypted block ***within an encoded frame***” as recited in claim 1 (emphasis added). Instead, the Candelore patent discloses pointers that point to the location of encrypted portions of the video data relative to the file. *See* Candelore patent col. 5, lines 32 – 35. As noted above, the system of claim 1 “demultiplex[es] the partially encrypted frame from the video chunk” prior to decryption (claim 1). Therefore, the pointers of Candelore that reference a location of an encrypted portion of a file cannot be directly and efficiently used to identify an encrypted block within an encoded frame after the partially encrypted frame of video has been extracted from the file.

Ex. 1103, 250–51.

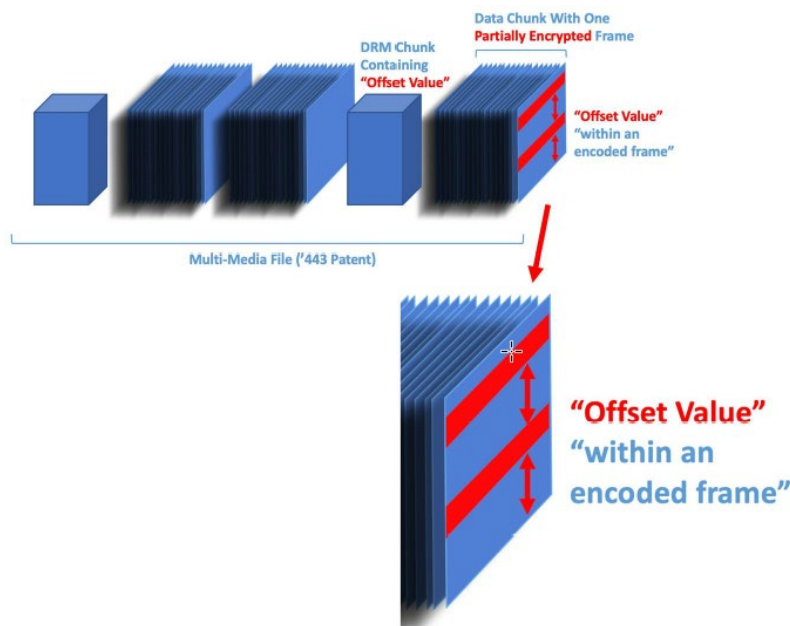
⁹ This citation corresponds to paragraph 23 of Candelore-II. Much of the quoted material from the applicants’ argument, however, corresponds to paragraph 25 of Candelore-II.

Following the applicants' arguments and amendments, the Examiner issued a Notice of Allowance. Ex. 1103, 54–65. The Examiner did not provide any explanation for the allowance of the claims. *See generally id.*

1. *The Parties' Arguments*

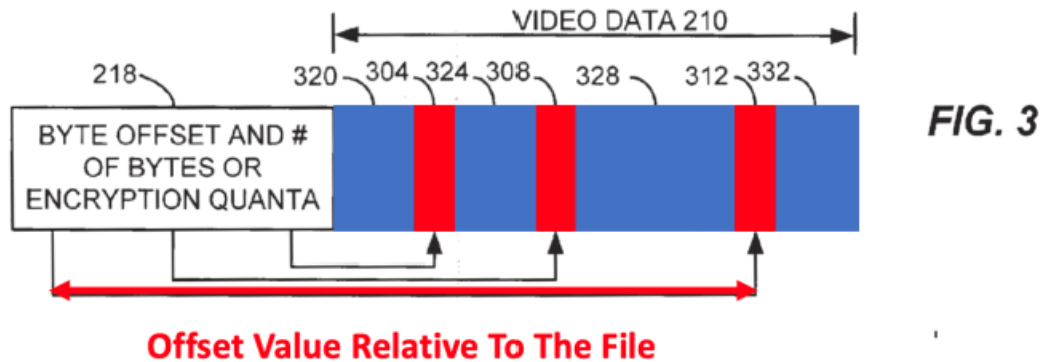
Patent Owner contends that the plain meaning of the claims, the Specification, and the prosecution history support Patent Owner's argument that "the claimed 'offset' must disclose an offset value 'within an encoded frame,' not 'relative to a file.'" Prelim. Resp. 32. In other words, Patent Owner asserts "that the claimed 'offset' must specify a value relative to the 'encoded frame,' as opposed to, for example, relative to the file." *Id.* at 35 (citing Ex. 2002 ¶ 41).

Patent Owner relies on the testimony of Dr. Bajaj, who provides the following illustration indicating how Patent Owner interprets the recited "offset value":



Prelim. Resp. 33 (citing Ex. 2002 ¶¶ 38–40). The illustration above provides a visual representation of what Patent Owner and Dr. Bajaj refer to as an

“[o]ffset value” (shown with red double-facing arrows) “within an encoded frame” (blue). Patent Owner and Dr. Bajaj compare their illustration to an annotated version of Candelore-II’s Figure 3, reproduced below:



Id. at 34 (citing Ex. 2002 ¶¶ 38–40). The annotated version of Figure 3, above, includes a red double-headed arrow indicating an “offset value relative to the file” (capitalization altered), red to indicate encrypted portions of data 304, 308, and 312, and blue to indicate unencrypted portions of data 320, 324, 328, and 332. Patent Owner contends that “there is a clear distinction between an ‘offset value’ that is ‘within an encoded frame’ versus an ‘offset value’ determined ‘relative to the file.’” *Id.* (quoting Ex. 2002 ¶ 40).

Starting with the claim language, Patent Owner argues that the claim language expressly requires “an ‘offset value’ that is ‘within an encoded frame.’” Prelim. Resp. 35 (citing Ex. 1101, 56:3–6 (limitation [1j]); 56:63–65 (limitation [7j])). Relying on Dr. Bajaj’s testimony, Patent Owner asserts that one of ordinary skill in the art “would understand that the claimed ‘offset’ must specify a value relative to the ‘encoded frame,’ as opposed to, for example, relative to the file.” *Id.* (citing Ex. 2002 ¶ 41).

Turning to the Specification of the ’443 patent, Patent Owner asserts that the Specification “explains that ‘the “offset” value 284 points to the start

of the encrypted block *within the frame*.” Prelim. Resp. 35 (citing Ex. 1101, 28:2–4). Additionally, relying on Dr. Bajaj’s testimony, Patent Owner argues that the Specification indicates “flexibility in how the DRM chunk is placed within the file, which may be ‘prior to the video chunk,’ or it may be at different locations ‘dependent upon the amount of buffering provided within [the] device decoding the multimedia file.’” *Id.* (quoting Ex. 2002 ¶ 42 (quoting Ex. 1001, 51:29–38)). Patent Owner asserts that “the ’443’s flexibility benefit cannot be realized in Candelore-II’s system (or the Petition’s combined system) that provides offset values ‘relative to the file’” because “the values of the file-relative pointers only correctly point to the encrypted portions of data if the relative locations of the file-relative pointers and the data blocks to which they point are fixed.” *Id.* at 36 (quoting Ex. 2002 ¶ 43); *see id.* at 37–38 (discussing another alleged benefit of the ’443 patent specification—“modification of a data chunk without impacting the DRM information for the unmodified portions of the data”—that Patent Owner contends would not be available in the combination proposed by Petitioner).

Additionally, Patent Owner asserts that “when the ’443’s specification intends to utilize a ‘file offset’ instead of an ‘offset . . . within an encoded frame’ as in the claims, it expressly says so.” Prelim. Resp. 38. Patent Owner identifies “the ‘hdr1’ chunk,” which Patent Owner contends “provides the location of various chunks ‘within the file,’ and therefore the ’443’s specification explains that it uses ‘file offsets in order to establish references.’” *Id.* (citing Ex. 1101, 50:47–52; Ex. 2002 ¶ 47). Patent Owner asserts that this language “relates to a different aspect of the invention that is the subject of a separate limitation, where claim 1 recites an index chunk

that ‘includes information concerning the location of data chunks *within the multimedia file*’ and, thus, does not relate to the ‘within an encoded frame’ limitation.” *Id.* (citing Ex. 1101, claim 1).

Patent Owner also relies on the prosecution history of the ’443 patent. *See, e.g.*, Prelim. Resp. 39. Patent Owner asserts that the applicants’ argument distinguishing the claim language from Candelore-II’s pointers constitutes “an unambiguous prosecution disclaimer.” *Id.* Patent Owner contends that the applicants’ argument makes clear that “the claimed ‘offset value’ is a value ‘within the encoded frame’ and thus points to a location *relative to the frame*.” *Id.* at 16 (emphasis added); *see id.* at 41 (“the claimed ‘offset value’ must disclose a value that points to a location relative to the encoded frame, and not ‘relative to a file’”).

In the Preliminary Reply, Petitioner asserts that Patent Owner’s “argument that the claimed ‘offset value’ must itself be ‘within the encoded frame’ is inconsistent with the claim language itself.” Prelim. Reply 7. Petitioner asserts that Patent Owner’s argument excludes nine words from the phrase “offset value that points to the start of an encrypted block within an encoded frame” because Patent Owner reads that phrase as “offset value within an encoded frame.” *Id.* at 7–8. Specifically, Petitioner asserts that Patent Owner’s argument omits the language specifying “where the offset value ‘points to.’” *Id.* at 8.

Petitioner contends that “[t]he claim language is silent as to where the offset value *points from*.” Prelim. Reply 8. Petitioner asserts that

[a]n offset value relative to the beginning of the file *points from* the beginning of the file, an offset value relative to a video chunk *points from* the video chunk, and an offset value relative to a frame *points from* a frame. All three offset values can be

stored in the same location in the file, *see* POPR 33 (*separately* identifying a “DRM Chunk Containing ‘Offset Value’” and an “Offset Value” “within an encoded frame”), but they would use different values, based on where the offset value *points from*, to point to the same encrypted block within an encoded frame. Nothing in the claim limitation limits where the offset value can *point from*. Even if the limitation required “an offset value within an encoded frame,” which it does not, the plain meaning of “within an encoded frame” would describe where the offset value is stored, not where it *points from*. Therefore, the distinction DivX allegedly disclaimed—that the offset value cannot be relative to the file—is absent from the plain meaning of the claim limitation.

Id. at 8–9.

Turning to the prosecution history, Petitioner contends that nothing in the applicants’ argument during prosecution “suggests that the Applicant intended to surrender claim scope.” Prelim. Reply 9. Rather, Petitioner asserts that these statements address other claim limitations, particularly “the ‘demultiplexing’ requirement of claim 1.” *Id.* at 4–5; *see id.* at 9–10 (referencing the same). Petitioner argues that the conclusion of the same paragraph identified by Patent Owner identifies demultiplexing among the list of limitations not disclosed by the references relied on by the Examiner. *Id.* at 4. Petitioner contends that the applicants “never raised a distinction between offset values ‘relative to a file’ and offset values ‘relative to a frame’ at any point during prosecution.” *Id.* at 9. According to Petitioner, “[t]o put it simply, the Applicant never said that offset values relative to a file are excluded from the scope of the claim, and certainly did not make any statements that would rise to the level of a clear and unmistakable disavowal.” *Id.* at 9–10.

Additionally, Petitioner asserts that the applicants' statements during prosecution support Petitioner's position that it is the encrypted block that is within an encoded frame, not an offset value. Prelim. Reply 10. Thus, Petitioner argues that the applicants' statements "contradict the alleged disclaimer requiring the offset value, and not the encrypted block to be 'within an encoded frame.'" *Id.*

In its Preliminary Sur-reply, Patent Owner asserts that "the plain meaning of the claims and the specification both indicate that the claimed 'offset' must disclose an offset value 'within an encoded frame,' not 'relative to a file.'" Prelim. Sur-reply 6. Patent Owner contends that Petitioner's Preliminary Reply does not respond to Patent Owner's arguments regarding the Specification and Dr. Bajaj's related testimony. *Id.* at 6–7 (citing Prelim. Resp. 35–38); *see also id.* at 6–8 (discussing Dr. Bajaj's testimony). Further, Patent Owner asserts that the prosecution history supports its position because the applicants contrasted the claim language with Candelore-II's pointers, which the applicants characterized as "relative to the file." *Id.* at 9–10; *see* Ex. 1103, 251 ("Instead, the Candelore patent discloses pointers that point to the location of encrypted portions of the video data relative to the file."). Patent Owner also contends that even if the applicants' statements do not rise to the level of a disclaimer, the arguments are relevant to understanding the plain meaning of the claim. *Id.* at 10.

2. *Analysis*

As discussed further below, the parties do not dispute that Candelore-II's pointers point to the location of encrypted portions of the

video data *relative to the file*.¹⁰ Additionally, Petitioner does not propose modifying Candelore-II's pointers in the combination presented. *See, e.g.*, Pet. 30–36 (addressing motivation to combine and reasonable expectation of success), 41–52 (addressing, *inter alia*, limitation [1j]). Thus, determining whether the claim scope excludes an offset value that is relative to the file resolves the parties' dispute regarding the claim term.

We begin with the claim language. Claim 1 recites, *inter alia*, that “at least one video chunk of the plurality of video chunks contains at least one partially encrypted frame of video so that only a portion of the encoded frame is encrypted” (limitation [1h]), that each DRM chunk “comprises DRM information to decrypt at least one partially encrypted frame of video” (limitation [1i]), and, as the focus of our inquiry, that “the DRM information comprises an offset value that points to the start of an encrypted block within an encoded frame” (limitation [1j]). Reading these limitations together, one of ordinary skill in the art would have understood at least the following from this claim language: (1) the identified encrypted frame of video is *partially* encrypted, (2) the encrypted *portion* is referred to as an *encrypted block*, (3) the *encrypted block is within* the encoded frame, and (4) the offset value points to the start of the encrypted block within the encoded frame.

Contrary to Patent Owner's plain-meaning argument, we do not agree that the plain meaning of the claim language is that the offset value must be limited to being *within the encoded frame*. Patent Owner's reading of the plain language would amount to reading “an offset value that points to the

¹⁰ Despite arguing against Patent Owner's narrower claim construction, Petitioner does not contest Patent Owner's argument that Candelore-II's pointers are *relative to the file*. *See generally* Pet.; Pet. Reply.

start of an encrypted block within an encoded frame” as “an offset value *within an encoded frame* that points to the start of an encrypted block within an encoded frame.” In other words, Patent Owner’s plain meaning argument *reads* additional language—“within an encoded frame”—into the claim after the phrase “offset value” such that “within an encoded frame” also modifies (i.e., limits) “offset value.” Contrary to Patent Owner’s argument, however, the claim language uses the phrase “within an encoded frame” to describe the location of the “encrypted block,” not the location of the “offset value.” In this regard, we agree with Petitioner that the claim language does not limit the location of the offset value such that it *must* be within an encoded frame.

We also agree with Petitioner that the claim language recites where the offset value *points to*; the claim language does not recite where the offset value *points from*. Specifically, an offset value, in the context of the ’443 patent, indicates some type of displacement from a starting point. As Petitioner explains “[a]n offset value relative to the beginning of the file *points from* the beginning of the file, an offset value relative to a video chunk *points from* the video chunk, and an offset value relative to a frame *points from* a frame.” Prelim. Reply 8. Here, the claim language itself does not limit expressly where the offset value *points from*; in other words, the claim language itself does not expressly limit what the offset value is *relative to*.

Turning to the Specification, we do not find it particularly helpful in addressing the parties’ dispute. First, neither party argues that the Specification provides a lexicographic definition of the claim language at issue, and we agree that the Specification does not.

Second, even if the Specification indicates a “desire[] to have flexibility in how the DRM chunk is placed within the file,” as Patent Owner argues and Dr. Bajaj opines (*see, e.g.*, Prelim. Resp. 35 (citing Ex. 2002 ¶ 42)), Patent Owner does not establish that such desire is reflected in any specific recitation in the claims. In other words, even if the Specification reveals an advantage or benefit of the invention in terms of the flexibility identified, that advantage or benefit is not recited in the claims and does not justify reading a limitation into the claims.

Third, the Specification includes a “conceptual representation of the information in a ‘DRM’ chunk,” reflected in Figure 2.9, reproduced above in our discussion of the ’443 patent. Ex. 1101, Fig. 2.9. And, the Specification explains the following regarding the DRM chunk:

The “DRM” chunk 270 can include a “frame” value 280, a “status” value 282, an “offset” value 284, a “number” value 286 and a “key” value 288. The “frame” value can be used to reference the encrypted frame of video. The “status” value can be used to indicate whether the frame is encrypted, the “offset” value 284 points to the start of the encrypted block within the frame and the “number” value 286 indicates the number of encrypted bytes in the block. The “key” value 288 references the decryption key that can be used to decrypt the block.

Id. at 27:64–28:6. Although the parties do not discuss this portion of the Specification in detail, we note that it describes a “frame” value that can be used to reference the encrypted frame of video and it also refers to an offset value that “points to the start of the encrypted block within the frame”—language that is similar to the claim language. Although the parties do not explain the interplay between frame value 280 and offset value 284, we find that one of ordinary skill in the art would have understood that, when used *in concert*, the frame value *could* be used to reference an encrypted frame and

the offset value *could* be used to designate an offset within that frame such that the offset points to the start of the encrypted block within the frame. In other words, where a frame value and offset value are employed, the offset value *could* be limited to an offset relative to the frame because the frame is already identified by the frame value. Nonetheless, this circumstance is not argued by the parties, claims 1 and 7 do not recite a frame value, and, importantly, even if this is one possible example that could exist, it is just one possibility and does not specifically *limit* the “offset value” such that the offset cannot be relative to something other than the frame, e.g., the file.

Fourth, we recognize that the Specification uses the phrase “file offsets” in the discussion of “Generating the ‘hdr1’ List Chunk.” Ex. 1101, 50:47–53. In particular, the Specification states

The “hdr1” list chunk is generated by the interleaver based on the information in the various chunks provided to the interleaver. The “hdr1” list chunk *references the location within the file of the referenced chunks*. In one embodiment, the “hdr1” list chunk uses *file offsets* in order to establish references.

Id. (emphases added). As this description states, file offsets are used, in one embodiment, to establish references to the location within the file of the referenced chunks. Thus, we agree with Patent Owner that the patentees knew how to refer to file offsets when intended. Nonetheless, we do not find that the use of different terms means that “file offsets” are distinguishable from an “offset value.” Rather, we find that one of ordinary skill in the art would have understood that a file offset is a particular type of offset that is relative to the file. The term “offset value” and its use in the Specification and claims, however, is broad enough to encompass a file

offset as well as other offset values because there is nothing specific in the claim language or Specification that indicates otherwise.

We now turn to the prosecution history. In particular, we find that the prosecution history sheds substantial light on how the applicants understood the disputed claim language. As set forth above, in response to rejections based on Candelore-II, the applicants raised two primary arguments. First, the applicants argued that Candelore-II “does not . . . appear to disclose partial encryption of encoded frames of video by encrypting at least one block of data within the partially encrypted frame so that only a portion of the encoded frame is encrypted.” Ex. 1103, 250. Second, and importantly, the applicants argued that Candelore-II’s failure to disclose partial encryption of encoded frames of video “*is highlighted by the Candelore patent’s failure to disclose DRM information including ‘an offset value that points to the start of an encrypted block **within an encoded frame** as recited in claim 1.*” *Id.* at 251 (first emphasis added). Critically, the very next sentence begins with the word *instead*, and states, “[i]nstead, the Candelore patent discloses pointers that point to the location of encrypted portions of the video data *relative to the file.*” *Id.* (emphases added). These two sentences from the applicants’ argument directly contrast the recited “offset value” language with Candelore-II’s disclosure. Specifically, the applicants sought to distinguish Candelore-II because its pointers are relative to the file.

We find that by contrasting Candelore-II’s pointers, the applicants “ma[d]e clear that the invention does not include a particular feature”—pointers that are relative to the file. *GE Lighting Solutions, LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014). And, we also find that the applicants’ arguments constitute a “clear and unmistakable disclaimer” of an

offset value that points to the start of an encrypted block within an encoded frame, where the offset value is relative to the file. *Thorner v. Sony Computer Ent. Am. LLC*, 669 F.3d 1362, 1366–67 (Fed. Cir. 2012). Although we agree with Petitioner that the applicants “never raised a distinction between offset values ‘relative to a file’ and offset values ‘relative to a frame’ at any point during prosecution,” we do not agree with Petitioner that the applicants “never said that offset values relative to a file are excluded from the scope of the claim.” Prelim. Reply 10. Rather, we find no other way to interpret the applicants’ arguments. As noted above, the applicants specifically stated that Candelore-II fails to disclose “DRM information including ‘an offset value that points to the start of an encrypted block *within an encoded frame*’” and then stated that “[i]nstead,” Candelore-II “discloses pointers that point to the location of encrypted portions of the video data relative to the file.” The applicants’ argument specifically identifies the claim language at issue here and specifically says that it is not disclosed because Candelore-II discloses something else *instead*.¹¹ Accordingly, for these reasons, we find that the applicants disclaimed “pointers that point to the location of encrypted portions of the video data relative to the file.”

Although we find disclaimer, it is important to clarify the scope of our finding. In particular, we do not agree with Patent Owner that the arguments raised by the applicants disclaim more than what we have indicated above.

¹¹ We also note that despite asserting an error in the applicants’ arguments during prosecution (i.e., whether Candelore-II teaches partial encryption of encoded frames), Petitioner does not assert that this argument by the applicants—that Candelore-II’s pointers are relative to the file—is incorrect. See Prelim. Reply 5–7.

Specifically, the express language of the claims recites what the offset value “points to” (i.e., “the start of an encrypted block within an encoded frame”), but the claim language does not recite expressly a relative location where the offset value points from. The applicants’ arguments disclaimed one option—pointing from (i.e., being relative to) the file. In other words, to the extent that Petitioner is correct that an offset value could be relative to a frame, a file, or a chunk (or even another reference point), our finding is only that the applicants disclaimed an offset value relative to a file. We do not agree with Patent Owner that the claim language, Specification, or prosecution history of the ’443 patent supports limiting the offset value such that it *must* be relative to a frame as opposed to some other reference point that is not the file.

For the purposes of resolving the parties’ controversy before us, we need not further construe the claim language expressly. In particular, as discussed below, each of Petitioner’s grounds relies on Candelore-II’s pointers as teaching the “offset value that points to the start of an encrypted block within an encoded frame” of limitations [1j] and [7j] without any assertion that it would have been obvious to one of ordinary skill in the art to modify the pointers such that they would not be relative to the file. As discussed further below, because Candelore-II’s pointers are relative to the file and pointers relative to a file are disclaimed from the scope of the claims, Petitioner has not established a reasonable likelihood that it would prevail in showing the unpatentability of at least one of the Challenged Claims.

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.

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.” (alteration in original))).

“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. Ground 1: Obviousness over Notoya, Matsui, Candelore-I, and Candelore-II

Petitioner asserts that the combination of Notoya, Matsui, Candelore-I, and Candelore-II would have rendered the subject matter of claims 1, 2, 4, 7, 8, 10, 13–16 obvious to one of ordinary skill in the art at the time of the invention. Pet. 30–83. Patent Owner contends that “Petitioner fails to show that the claimed ‘offset value’ as properly construed is disclosed or rendered obvious by its grounds.” Prelim. Resp. 31–47 (capitalization from heading altered). Because we find this issue dispositive, we focus our discussion of the claims on the recitation of an “offset value” in limitations [1j] and [7j].

1. Level of Ordinary Skill in the Art

Above, we set forth the level of ordinary skill in the art. *See supra* § I.G.

2. Scope and Content of the Prior Art

a. Notoya

Notoya is directed to “a demultiplexing device that demultiplexes multimedia data such as image data and music data and to a multiplexing device that multiplexes multimedia data,” particularly MP4 files. Ex. 1104 ¶ 1; *see id.* ¶ 9, Fig. 1. Notoya explains that “MP4 has been attracting

attention as a file format for multiplexing and storing multimedia data (content such as video, audio, text, and still images).” *Id.* ¶ 2. Notoya states that “[t]he MP4 file format originally consisted of a single data box containing multiplexed content and a header box containing information related to the content in the data region of the data box.” *Id.* ¶ 4. According to Notoya, it takes “a while” for a multiplexing device to create a header box when there is a large amount of multimedia data. *Id.* ¶ 6. Notoya explains that “the MP4 file format was improved so that multiple pairs of data boxes and header boxes could be linked.” *Id.* ¶ 8. Notoya’s MP4 file is “suitable for streaming because it is configured so that a plurality of linked pairs of data boxes and header boxes are created as shown in Fig. 1 to Fig. 3.” *Id.* ¶ 40.

Notoya’s Figure 1 is reproduced below:

Fig. 1

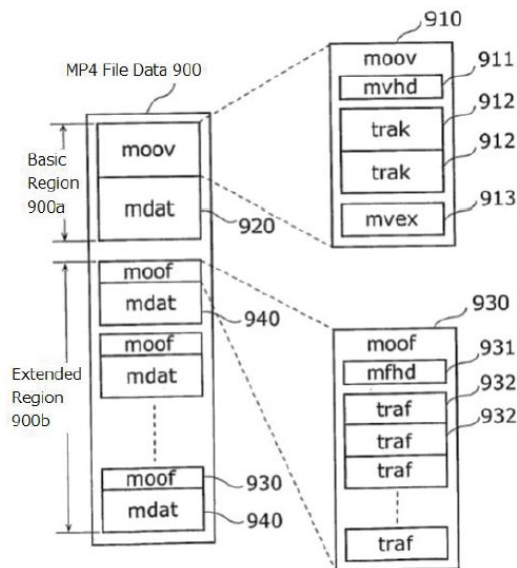


Figure 1 “is a data configuration diagram showing the improved basic file format for MP4 file data.” Ex. 1104 ¶ 9. Notoya explains that “[t]he MP4 file data 900 is composed of a basic region 900a and an extended

region 900b. The basic region 900a includes a movie box ('moov' below) 910 that is a header box and media data box ('mdat' below) 920 that is a data box." *Id.* ¶¶ 10–11. Notoya teaches that "extended region 900b includes a plurality of linked pairs of a single movie fragment box ('moof' below) 930 that is a header box and a single media data box ('mdat' below) 940 that is a data box." *Id.* ¶ 13. "[M]oof 930 includes a single movie fragment header box ('mfhd' below) 931 and a plurality of track fragment boxes ('traf' below) 932." *Id.* ¶ 14. Notoya explains that a benefit of configuring MP4 file data 900 with a plurality of linked pairs of data boxes and header boxes is that "a demultiplexing device that reproduces content by acquiring and demultiplexing MP4 file data 900 can sequentially play (download and play) MP4 file data 900 distributed as a stream before all of the downloading has been completed." *Id.* ¶ 40.

Additionally, Notoya explains that its demultiplexing device can be "configured as a mobile phone [that] downloads MP4 file data 900 distributed as a stream via a base station 990, and sequentially plays back the downloaded MP4 file data 900." Ex. 1104 ¶ 75.

b. Matsui

Matsui is directed to "a device for reproducing a multiplex file of video data, audio data and the like, and especially a technology for facilitating random access [(RA)] playback such as reproduction position change or fast forward reproduction." Ex. 1107, 1:6–9.¹² Matsui explains

¹² Citations are to the page and line numbers indicated on the underlying document as opposed to the pages of the exhibit.

that Figure 9 “is an illustration showing the relation between the MP4 file and the random access information table.” *Id.* at 12:5–6.

Figure 9(a) is reproduced below:

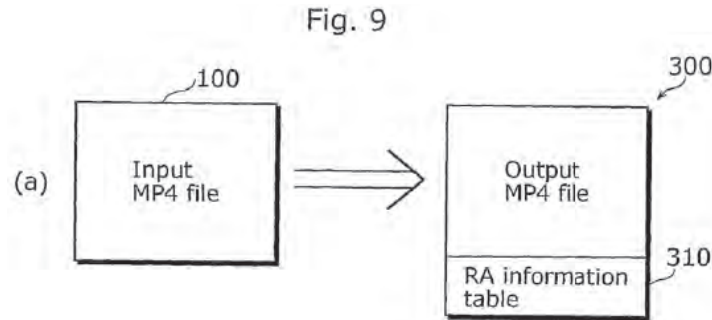


Figure 9(a) “is a diagram showing the file generated by the movie picture data reproducing device.” Ex. 1107, 12:6–9. In Figure 9, “when MP4 file 100 . . . is accepted by the device, RA information table 310 is added to the end of the [MP4] file, and the file is outputted as a new MP4 file 300 into which RA information table 310 is integrated.” *Id.* at 30:3–6.

Figures 5(a) and 5(b) are reproduced below:

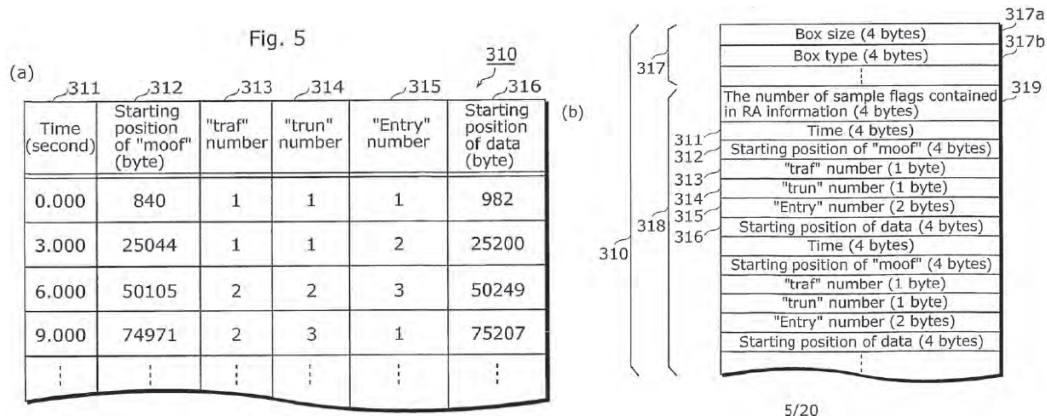


Figure 5 “is a diagram showing the random access information table. Fig. 5A is a diagram showing the data contained in the table, and Fig. 5B is a diagram showing the data structure of the table.” Ex. 1107, 11:24–26. Matsui explains that “RA information table 310 has [the] same number of lines as the number of RA information stored in the table, and has a structure

in which a piece of RA information is written per line. Each line provides the location and the presentation time of the random access sample,” referred to as an “RA entry.” *Id.* at 21:21–25.

Figure 6 is reproduced below:

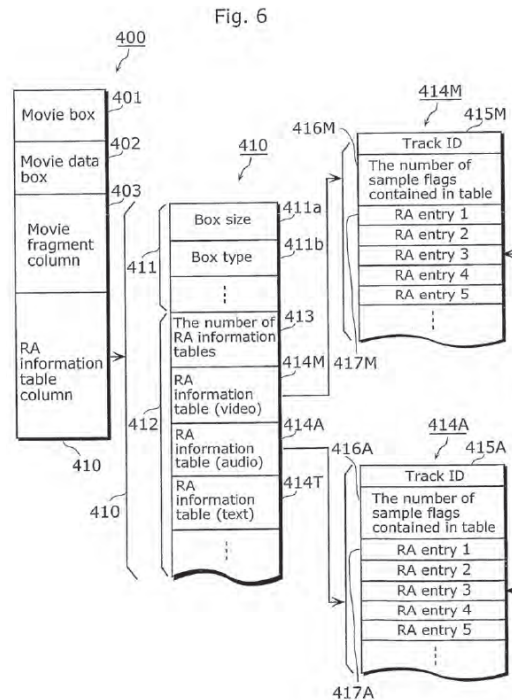


Figure 6 “is a diagram showing the file structure” of MP4 file 400.

Ex. 1107, 24:2–4. Matsui states that MP4 file 400 comprises “movie data box 402, movie fragment column 403 and RA information table column 410.” *Id.* at 24:5–8.

Additionally, Matsui teaches a “moving picture distribution system” where a phone or computer “downloads an MP4 file from server device 801 that distributes an MP4 file in which video data, audio data and so on are multiplexed via communication network 802.” Ex. 1107, 51:10–19, Fig. 20.

c. Candelore-I

Candelore-I is directed to a partial frame encryption technique that produces a star pattern partial encryption. *See* Ex. 1105, code (54). Figure 6 is reproduced below:

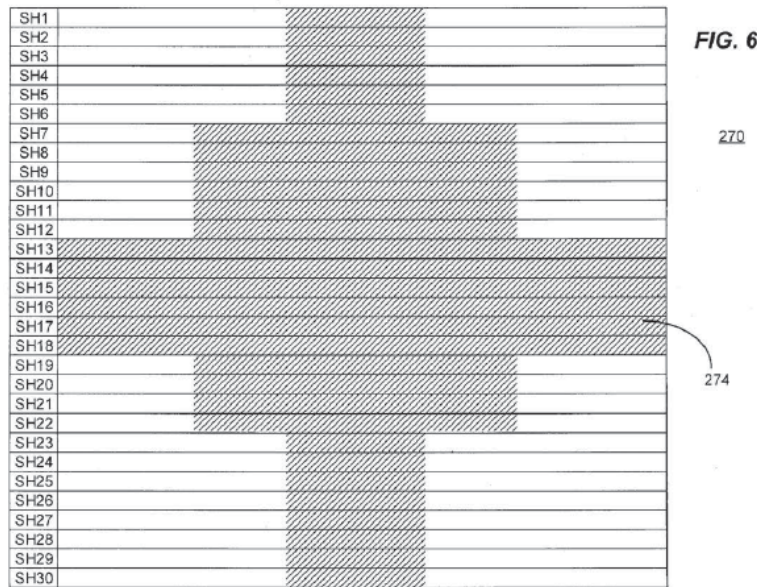


Figure 6 “illustrates a star pattern of encrypted packets.” *Id.* ¶ 12.

Candelore-I explains that, in the embodiment shown in Figure 6, “slices in a central area of the frame 270 are encrypted with a star pattern 274 extending outward radially from the upper center of the frame. In this embodiment, macroblocks having intracoded data are encrypted if they fall within the shaded area of the star pattern 274.” *Id.* ¶ 40.

d. Candelore-II

Candelore-II is directed to “[a] method and apparatus for enabling use of multiple digital rights management scenarios (DRM).”¹³ Ex. 1106, code (57). Candelore-II incorporates Candelore-I by reference. *Id.* ¶ 2.

¹³ Candelore-II explains that “DRMs typically verify that the consumer has paid for viewing the content.” Ex. 1106 ¶ 35.

Candelore-II teaches that “content stored in the content database 130 is stored with dual (in general multiple) selective encryption consistent with the content provider’s dual (multiple) DRMs.” *Id.* ¶ 28.

Figure 2 of Candelore-II is reproduced below:

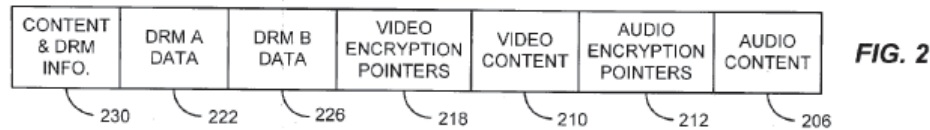


Figure 2 “illustrates an exemplary file structure.” Ex. 1106 ¶ 12.

Candelore-II explains that “[i]n this file structure, the file delivered to the customer is stored with selected portions multiply encrypted.” *Id.* ¶ 29. In a non-limiting example, Candelore-II teaches that “if the content is stored as MPEG data, one can encrypt all of the MPEG I frames or video slice headers to achieve a substantial level of encryption without need to encrypt the entire file.” *Id.* In the example of Figure 2, “the selected portions are encrypted under an encryption arrangement consistent with DRM A in one case and consistent with DRM B in the other. The content is then reassembled with the duplicated encrypted content replacing the original clear content.” *Id.*

Further describing Figure 2, Candelore-II explains that “[i]n this example of Audio/Video content, the content is stored as audio content 206 and video content 210.” Ex. 1106 ¶ 30. Candelore-II teaches that “[t]he file further contains a set of audio encryption pointers 212 that point to the selected portions of the audio content that are encrypted” and “the file further contains a set of video encryption pointers 218 that point to the selected portions of the video content that are encrypted.” *Id.*

Figure 3 is reproduced below:

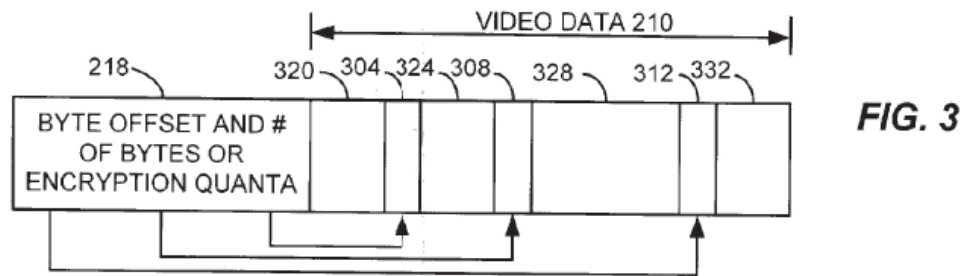


Figure 3 “illustrates a byte offset arrangement for video data” describing “[t]he relationship between the video data 210 and video encryption pointers 218.” Ex. 1106 ¶¶ 13, 31. Candelore-II explains that “[p]ointers are stored that point to encrypted portions of the video data in the file. Such encrypted portions are shown as 304, 408 and 312. Such encrypted portions are interspersed with portions of data stored unencrypted (In the clear) shown as 320, 324, 328 and 332.” *Id.* ¶ 31. Candelore-II teaches that “the number of bytes to be encrypted can be predefined if desired as the encryption quanta so that the encryption pointers can be simply a sequence of memory offset locations. The amount of data encrypted is then determined by a preset encryption quanta (e.g., 8 bytes).” *Id.* ¶ 33. “In other embodiments, the encryption pointer section can include not only a starting offset but also an ending offset or a starting offset and a number of bytes.” *Id.*

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

As noted above, “offset value” is recited in limitations [1j] and [7j]. In addressing claim 1, Petitioner’s discussion of the “offset value” begins with its discussion of limitation [1f] and includes Petitioner’s discussion of limitations [1i] and [1h]. Accordingly, in our analysis below, we begin with Petitioner’s discussion of limitation [1f] before turning to Petitioner’s

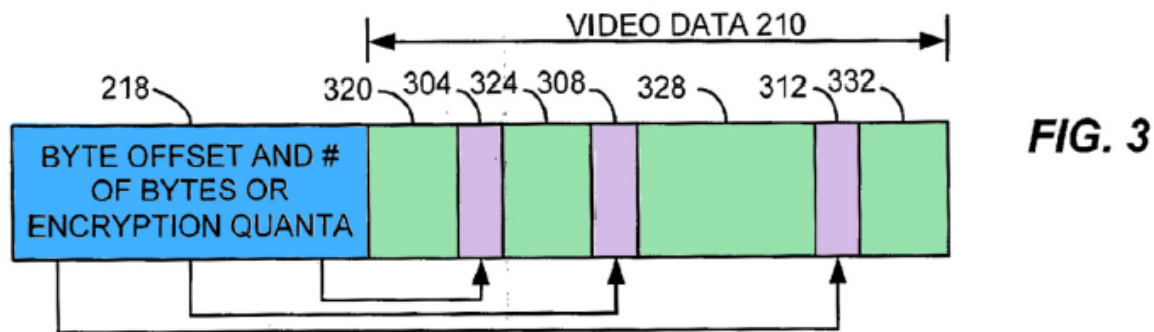
discussion of limitations [1h], [1i], and [1j]. We then address Patent Owner’s arguments in response, which are directed to limitation [1j].

a. Claim 1 – Petitioner’s Arguments

i. Limitation [1f]

Limitation [1f] recites, in relevant part, “a set of digital rights management (DRM) chunks.” Ex. 1101, 55:60–61. Petitioner relies on Notoya and Candelore-II as teaching limitation [1f]. Pet. 41–45.

As shown in Petitioner’s colorized version of Candelore-II’s Figure 3, reproduced below, Petitioner contends that “Candelore-II teaches ‘*a set of video encryption pointers 218* that point to the selected portions of the video content that are encrypted.’” Pet. 41 (citing Ex. 1106 ¶ 30, Fig. 2).

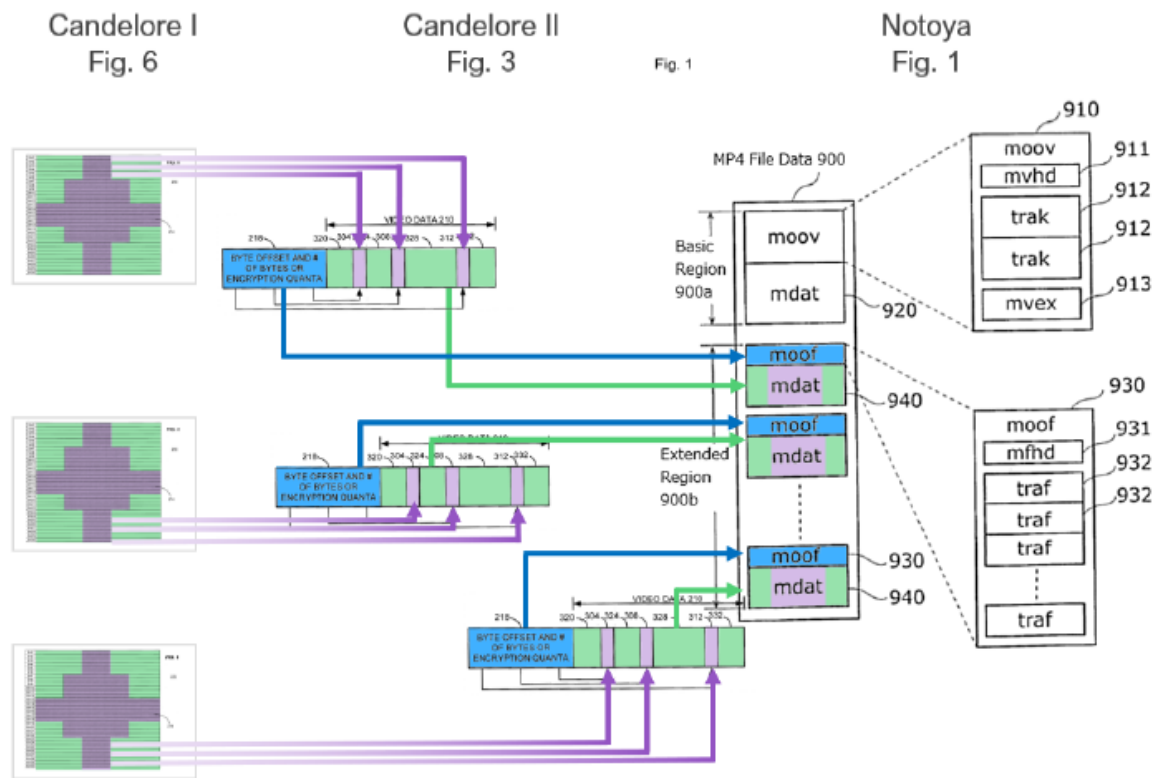


Id. at 42. Candelore-II’s Figure 3 is reproduced above with color added by Petitioner to illustrate encryption pointers 218 (blue) and differentiate encrypted video content (purple) and unencrypted video content (green). Petitioner contends that, as shown in Figure 3, “Candelore-II’s video encryption pointers 218 [blue], which contain byte offset and # of encrypted bytes, are located before the video data and point to the encrypted content, shown by purple boxes.” *Id.* Petitioner asserts that “Candelore-II’s video encryption pointers 218 are a DRM chunk because they contain information concerning the encryption of the video chunk.” *Id.* (citing Ex. 1102 ¶¶ 185–186).

Petitioner explains the following regarding combining the teachings of Candelore-II and Notoya. “First,” Petitioner asserts that “Notoya teaches that the mdat box is a data box for ‘storing multiplexed content.’” Pet. 42–43 (citing Ex. 1104 ¶¶ 11, 13, 26). Petitioner contends that one of ordinary skill in the art “would have added the video data to an mdat box because Notoya teaches that mdat boxes store the actual data, including the actual video data.” *Id.* at 43 (citing Ex. 1102 ¶¶ 189–190).

“Second,” Petitioner asserts that “Candelore-II’s ‘video encryption pointers’ ‘point to the selected portions of the video content that are encrypted.’” Pet. 43 (citing Ex. 1106 ¶ 30). Petitioner contends that one of ordinary skill in the art “would have understood that Candelore’s video encryption pointers include information about the video content, also header information or metadata.” *Id.* (citing Ex. 1102 ¶ 185). Petitioner asserts that “Notoya teaches that a moof box is . . . ‘a box storing information related to the content of [the mdat box]’” (*id.* (quoting Ex. 1104 ¶ 26)), and, thus, one of ordinary skill in the art would have “added Candelore-II’s video encryption pointers, which have header information concerning the locations and sizes of encrypted video data, in the moof box corresponding to the mdat box containing the encrypted video data” (*id.* (citing Ex. 1104 ¶ 26; Ex. 1102 ¶¶ 184–190)).

“Third,” Petitioner asserts that “Notoya’s MP4 file contains multiple video chunks” and that, in the combination proposed, “[e]ach mdat box containing a video chunk with encrypted data would have a corresponding DRM chunk.” Pet. 43 (citing Ex. 1102 ¶ 189). Petitioner relies on a combination of Figure 6 from Candelore-I, Figure 3 from Candelore-II, and Figure 1 from Notoya, reproduced below.



Pet. 44. Petitioner's figure above is a combination of Figure 6 from Candelore-I, Figure 3 from Candelore-II, and Figure 1 from Notoya, where the encrypted portions are purple, the unencrypted portions are green, and the encryption pointers are blue. *Id.*

Referring to its detailed explanation as to why one of ordinary skill in the art would have been motivated to combine with a reasonable expectation of success (*see* Pet. 44 (referring to Petition § XI.A.1)), Petitioner reiterates that one of ordinary skill in the art “would have been motivated to add Candelore-II’s video encryption pointers to the moof as shown in the above figure.” *Id.* (citing Ex. 1102 ¶ 191). In particular, Petitioner asserts that one of ordinary skill in the art

would have been motivated to include DRM chunks in each moof to enable streaming or download playback. Notoya teaches that its file is “suitable for streaming . . . because a demultiplexing device that reproduces content by acquiring and

demultiplexing MP4 file data 900 can sequentially play (download and play) MP4 file data 900 distributed as a stream before all of the downloading has been completed.” Ex. 1104, [40]. Similarly, placing the DRM chunk in the moof box in front of the mdat box allows a playback device to decode and playback the file without having to wait for the entire file to be downloaded. In addition, including a DRM chunk in each moof prevents storing one large DRM chunk in the moov¹⁴ for the entire file, similar to the reduction in size in the moov that results from the fragmented MP4 file. Ex. 1113,¹⁵ [0050], FIG. 3, FIG. 4. A smaller moov can be downloaded quicker, allowing the video to begin playing faster. Ex. 1107, 2:25-3:2; Ex. 1102, ¶191.

A [person of ordinary skill in the art] would have been further motivated to include a DRM chunk in the moof to reduce the number of calculations for random access. A device attempting to randomly access a portion of the file would not have to pull DRM information from another part of the file if the DRM chunk is included in the moof before the mdat. Ex. 1102, ¶192.

Pet. 45 (footnotes added).

ii. Limitation [1h]

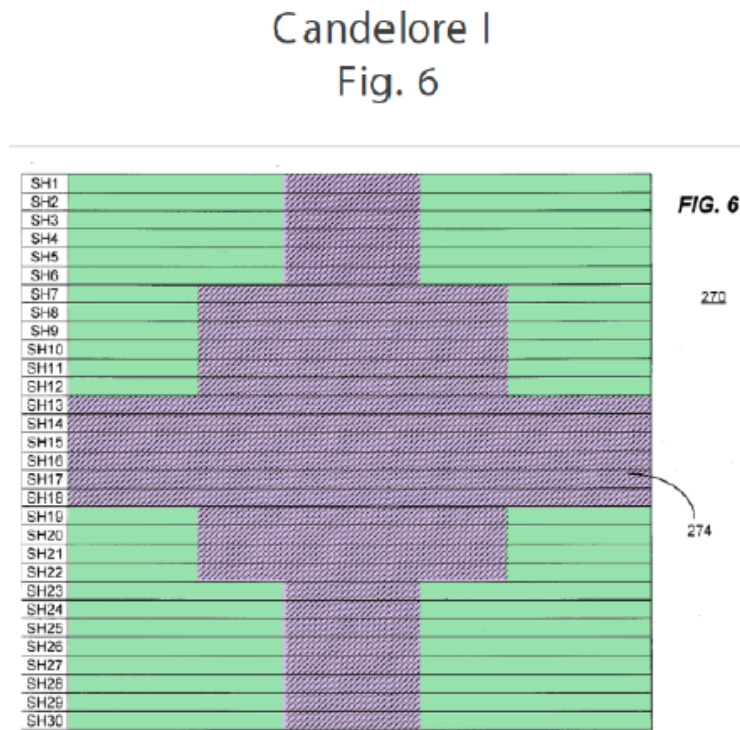
Limitation [1h] recites “at least one video chunk of the plurality of video chunks contains at least one partially encrypted frame of video so that only a portion of the encoded frame is encrypted.” Ex. 1101, 55:62–65. Petitioner contends that the combination of Notoya, Candelore-I, and Candelore-II teaches limitation [1h]. Pet. 47–50.

Petitioner asserts that “Candelore-I teaches encrypting only portions of an MPEG encoded video frame in a star pattern.” Pet. 48 (citing Ex. 1105

¹⁴ Notoya refers to a movie box as a “moov.” See Ex. 1104 ¶ 11.

¹⁵ U.S. Patent Application Publication No. 2004/0231004 A1, published Nov. 18, 2004.

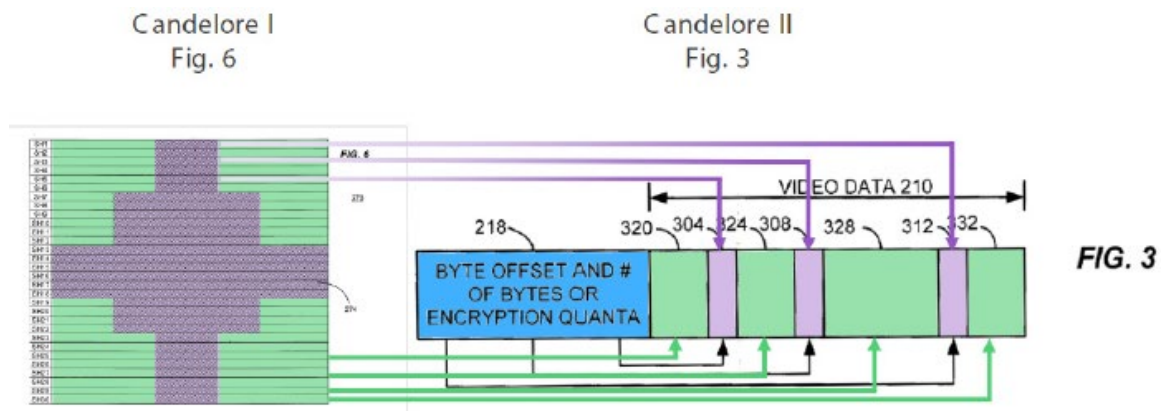
¶ 40). Reproduced below is Petitioner’s annotated version of Candelore-I’s Figure 6, in which MPEG encoded video frame 270 is shown with purple sections encrypted and green sections unencrypted:



Id. (citing Ex. 1105, Fig. 6, ¶ 40). As noted above, Candelore-I’s Figure 6 is reproduced above with color added by Petitioner to differentiate encrypted sections (purple) from unencrypted sections (green) of an MPEG encoded video frame.

Petitioner asserts that “Candelore-I specifically teaches the partial encryption of *encoded* frames.” Pet. 48 (citing Ex. 1105 ¶¶ 46–48; Ex. 1102 ¶¶ 198–200). Petitioner contends that Candelore-I teaches that “intracoded data,” which one of ordinary skill in the art would have understood to be “encoded data,” “are encrypted if they fall with[in] the shaded area of the star pattern 274.” *Id.* at 48–49 (citing Ex. 1105 ¶ 40; Ex. 1102 ¶¶ 200–202).

Petitioner contends that it would have been obvious “to use Candelore-I’s star pattern encryption method with Candelore-II’s video encryption pointers because Candelore-II expressly mentions that ‘the selected video data to be encrypted may be . . . data in a star pattern within the video frame.’” Pet. 49 (quoting Ex. 1106 ¶ 25) (citing Ex. 1102 ¶ 203). Petitioner relies on a combination of Candelore-I’s Figure 6 and Candelore-II’s Figure 3, reproduced below, wherein both the unencrypted and encrypted portions of Candelore-I’s partially encrypted encoded frame are added to Candelore-II’s Figure 3. *Id.*



Referring to its detailed explanation as to why one of ordinary skill in the art would have been motivated to combine with a reasonable expectation of success (*see* Pet. 50 (referring to Petition § XI.A.1)), Petitioner asserts that “it would have been obvious to add Candelore-II’s video data 210 to the mdat boxes in Notoya’s MP4 files.” *Id.* In the combination proposed, “at least one video chunk in Notoya’s modified MP4 file would include a partially encrypted encoded frame.” *Id.* (citing Ex. 1102 ¶ 205). And, Petitioner asserts that one of ordinary skill in the art would have been

motivated to combine Notoya with Candelore-I and Candelore-II with a reasonable expectation of success. *Id.* (citing Ex. 1102 ¶¶ 206–207) (referring to Petition § XI.A.1.).

iii. Limitation [1i]

Limitation [1i] recites “each DRM chunk of the set of DRM chunks comprises DRM information to decrypt at least one partially encrypted frame of video in at least one video chunk of the plurality of video chunks.” Ex. 1101, 55:66–56:2. Petitioner asserts that the combination of Notoya, Candelore-I, and Candelore-II teaches limitation [1i]. Pet. 50–51.

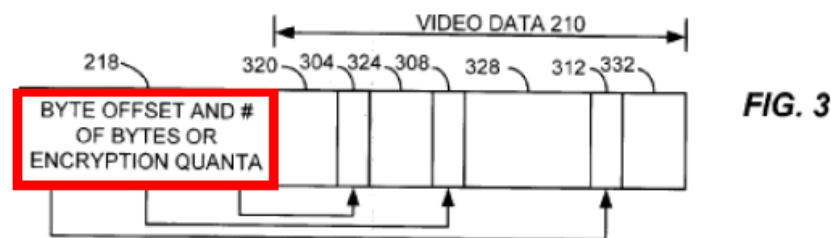
Petitioner contends that, for the reasons explained in the context of limitation [1f], “Notoya in view of the Candelore references teaches a set of DRM chunks, where each DRM is comprised of Candelore-II’s video encryption pointers 218.” Pet. 50 (citing Ex. 1106 ¶¶ 29, 30). Further, Petitioner asserts that, for the reasons explained in the context of limitation 1[h], “these encryption pointers can be used with Candelore-I’s star pattern encryption method to partially encrypt at least one frame of video in at least one video chunk of the plurality of video chunks.” *Id.* (citing Ex. 1102 ¶ 209).

Petitioner argues that “Candelore-II’s encryption pointers comprise DRM information.” Pet. 50. Petitioner asserts that “Candelore-II teaches that the video encryption pointers . . . ‘point to the selected portions of the video content that are encrypted,’” the “encryption pointer section can include not only a starting offset but also an ending offset or a starting offset and a number of bytes,” “[t]he video encryption pointers’ ‘number of bytes’ correspond to the ‘size (i.e., the encryption quanta)’ of the encrypted segment,” and “[t]his information is DRM information that can be used to

decrypt partially encoded frames by locating the encrypted data.” *Id.* at 50–51 (citing Ex. 1106 ¶¶ 30, 31, 33, Fig. 3). Additionally, Petitioner relies on its arguments and evidence directed to motivation to combine and reasonable expectation of success referred to above. *Id.* at 51 (referring to Petition § XI.A.1.).

iv. Limitation [1j]

Limitation [1j] recites that “the DRM information comprises an offset value that points to the start of an encrypted block within an encoded frame and a number value that indicates the number of encrypted bytes in the encrypted block.” Ex. 1101, 56:3–7. Petitioner contends that Candelore-II teaches limitation [1j]. Pet. 52 (citing Ex. 1102 ¶¶ 219–220). As discussed in the context of limitation [1i], Petitioner contends that “Candelore-II’s ‘video encryption pointers’ comprise DRM information.” *Id.* at 51 (citing Ex. 1102 ¶¶ 214–216). Petitioner asserts that “Candelore-II teaches that ‘the encryption pointer section can include . . . a starting offset[,]’” and identifies the “BYTE OFFSET” shown in Candelore-II’s video encryption pointers 218 of Figure 3. *Id.* at 52 (citing Ex. 1106 ¶ 33). Petitioner relies on an annotated version of Candelore-II’s Figure 3, reproduced below. *Id.*



Id. Petitioner annotated Candelore-II’s Figure 3 by adding a red box around video encryption pointers 218. *Id.*

Relying on its discussion of limitation [1h], Petitioner contends “Notoya in view of the Candelore references teaches partially encrypting

encoded frames in a star pattern. Therefore, Candelore-II's encryption pointers include an offset value that points to the start of an encrypted block within an encoded frame.” Pet. 52 (citing Ex. 1102 ¶ 217).

Additionally, Petitioner asserts that “Candelore-II also teaches that video encryption pointer[]s can include ‘a number of bytes,’” as shown above in Figure 3 as the “# of BYTES.” Pet. 52 (citing Ex. 1106 ¶ 33, Fig. 3). Petitioner contends that “[t]he number of bytes is a number value that indicates the number of encrypted bytes in the encrypted block” and, therefore, “Candelore-II's video encryption pointers include a number value that indicates the number of encrypted bytes in the encrypted block.” *Id.* (citing Ex. 1102 ¶ 218). Petitioner relies on its arguments and evidence directed to motivation to combine and reasonable expectation of success referred to above. *Id.* (referring to Petition § XI.A.1.).

b. Claim 1 – Patent Owner's Arguments

Patent Owner challenges Petitioner's analysis of limitation [1j] and, particularly, Petitioner's reliance on Candelore-II as teaching “an offset value that points to the start of an encrypted block within an encoded frame.” Prelim. Resp. 31–47. Patent Owner contends that “Candelore-II's pointers reference a location ‘relative to the file,’ and not ‘within an encoded frame’ as required by the claims.” *Id.* at 31 (citing Ex. 1103, 250–51). Patent Owner asserts that the applicants raised this argument during prosecution to distinguish Candelore-II from the claims and that the argument “operate[s] as an unambiguous disclaimer, precluding the possibility that the claimed ‘offset value’ could be construed to cover an offset that is not ‘within an encoded frame’ but is instead a value ‘relative to the file.’” *Id.* at 32.

Patent Owner contends that Candelore-II “explains that the encryption pointers are ‘*memory* offset *locations*,’ which would point to where various portions of the file are stored in memory and has no dependence on any offset value within any encoded frame.” Prelim. Resp. 41–42 (citing Ex. 1106 ¶ 33). Patent Owner asserts that Candelore-II states that “pointers point to the location of ‘video data *in the data file*.’” *Id.* at 42 (quoting Ex. 1106 ¶ 31). And, Patent Owner argues that Figure 3 of Candelore-II “makes clear by its schematic arrows that the pointers for blocks 304, 308 and 312 relate back to block 218, which is a location within the file, and not within the video frame to which they belong.” *Id.* (citing Ex. 1106, Fig. 3; Pet. 42, 44).

Additionally, Patent Owner asserts that the Petition does not propose modifying Candelore-II’s pointers in the combination proposed such that they are not relative to the file (*see* Prelim. Resp. 42–47) and the Petition provides no reason as to why one of ordinary skill in the art would have been motivated to do so (*see id.* at 46–47).

c. Claim 1 – Analysis

As discussed above in our consideration of the parties’ arguments regarding the meaning of “an offset value that points to the start of an encrypted block within an encoded frame,” we determine that the applicants disclaimed an offset value that is relative to the file. *See supra* § II.A.2. On the present record, we find Patent Owner’s argument and evidence persuasive regarding Candelore-II’s disclosure. In particular, Patent Owner identifies the teachings of Candelore-II directed to its pointers, and Candelore-II’s description and Figure 3 support Patent Owner’s argument that Candelore-II’s pointers are relative to the file. *See, e.g.*, Prelim.

Resp. 42 (citing Ex. 1106 ¶ 31, Fig. 3). Additionally, Petitioner does not contest Patent Owner's position that Candelore-II teaches pointers that are relative to the file. *See generally* Pet.; Prelim. Reply. Further, as applied to the combination, Petitioner does not propose modifying Candelore-II's pointers such that they are not relative to the file. *See, e.g.*, Pet. 30–36 (discussing motivation and reasonable expectation of success), 41–53 (discussing, *inter alia*, limitations [1f], [1h], [1i], and [1j]).

Accordingly, because Petitioner relies on the same teaching of Candelore-II that was disclaimed from the scope of the claims during prosecution of the '443 patent, Petitioner has not shown sufficiently on the present record that the combination of Notoya, Matsui, Candelore-I, and Candelore-II teaches or suggests the subject matter of limitation [1j] and, hence, claim 1.

d. Independent Claim 7 and Dependent Claims 2, 4, 8, 10, 14, and 16

As noted above, limitation [7j] of independent claim 7 recites the same “offset value” language as limitation [1j] and Petitioner relies on its arguments and evidence directed to limitation [1j] in its discussion of limitation [7j]. *See* Pet. 72–73 (limitation [7j]). For the same reasons discussed above, we find that the same deficiency regarding claim 1 applies equally to claim 7 and the claims that depend from claim 1 or claim 7—claims 2, 4, 8, 10, 14, and 16.

Accordingly, because Petitioner relies on the same teaching of Candelore-II that was disclaimed from the scope of the claims during prosecution, Petitioner has not shown sufficiently on the present record that the combination of Notoya, Matsui, Candelore-I, and Candelore-II teaches

or suggests the subject matter of limitation [7j] and, via their dependency from claim 1 or claim 7, the subject matter of dependent claims 2, 4, 8, 10, 14, and 16.

4. *Objective Considerations of Nonobviousness*

Neither party presents evidence of objective considerations of nonobviousness at this stage of the proceeding.

5. *Weighing the Graham Factors*

“Once all relevant facts are found, the ultimate legal determination [of obviousness] involves the weighing of the fact findings to conclude whether the claimed combination would have been obvious to an ordinary artisan.” *Arctic Cat*, 876 F.3d at 1361. On balance, considering the record before us, Petitioner has not established a reasonable likelihood that it would prevail in showing that the combination of Notoya, Matsui, Candelore-I, and Candelore-II would have rendered the subject matter of claims 1, 2, 4, 7, 8, 10, 14, and 16 of the ’443 patent obvious to one of ordinary skill in the art at the time of the invention.

C. *Ground 2: Obviousness over Notoya, Matsui, Candelore-I, Candelore-II, and Mowry*

Petitioner contends that the combination of Notoya, Matsui, Candelore-I, Candelore-II, and Mowry would have rendered the subject matter of dependent claims 4, 10, and 16 obvious to one of ordinary skill in the art at the time of the invention. Pet. 83–88. In addressing these claims, Petitioner does not rely on Mowry as teaching the recited “offset value” of limitations [1j] and [7j] or otherwise propose modifying Candelore-II’s pointers such that they are not relative to the file. *See id.*

Accordingly, because Petitioner relies on the same teaching of Candelore-II that we find disclaimed from the scope of the claims, we reach the same determination. Specifically, Petitioner has not shown sufficiently on the present record that the combination of Notoya, Matsui, Candelore-I, Candelore-II, and Mowry teaches or suggests the subject matter of limitations [1j] and [7j], which, via dependency, is recited in each of the claims challenged in this Ground. Thus, on balance, considering the record before us, Petitioner has not established a reasonable likelihood that it would prevail on this Ground.

IV. CONCLUSION

For the foregoing reasons, Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that at least one claim of the '443 patent is unpatentable.

V. ORDER

Accordingly, it is:

ORDERED that the Petition is *denied* as to the Challenged Claims of the '443 patent; and

FURTHER ORDERED that no *inter partes* review is instituted.

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