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Paper 50
Entered: December 5, 2024

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

META PLATFORMS, INC., INSTAGRAM, INC., WHATSAPP LLC, META PLATFORMS TECHNOLOGIES, LLC, and GIPHY, INC.,
Petitioner,

v.

VL COLLECTIVE IP LLC,
Patent Owner.

IPR2023-00923
Patent 7,266,682 B2

Before KARL D. EASTHOM, JEFFREY S. SMITH, and DAVID C. MCKONE, *Administrative Patent Judges.*

Opinion for the Board filed by *Administrative Patent Judge* SMITH.

Opinion Dissenting filed by *Administrative Patent Judge* McKONE.

SMITH, *Administrative Patent Judge*.

DECISION
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background and Summary

Meta Platforms, Inc, Instagram, Inc., WhatsApp LLC, Meta Platforms Technologies, LLC, and GIPHY, Inc. (collectively, "Petitioner") filed a Petition (Paper 3, "Pet.") requesting *inter partes* review of claims 1–28 of U.S. Patent No. 7,266,682 B2 (Ex. 1001, "the '682 patent") pursuant to 35 U.S.C. § 311(a). Patent Owner filed a Preliminary Response. Paper 11 (Prelim. Resp.). We issued an Institution Decision (Paper 16) instituting the petitioned review.

VL Collective IP LLC ("Patent Owner") filed a Patent Owner's Response (Paper 26, "PO Resp.") pursuant to 35 U.S.C. § 313. Petitioner filed a Reply (Paper 37, "Reply"), and Patent Owner filed a Sur-Reply (Paper 44, "PO Sur-Reply"). We also issued an Order granting Petitioner's Motion to Submit Supplemental Information (Paper 28, "Order") and an Order granting Patent Owner's Motion to Submit Supplemental Information (Paper 41).

We have jurisdiction under 35 U.S.C. § 6(b)(4) and § 318(a). 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 claims 1–28 of the '682 patent. We determine Petitioner has shown by a preponderance of the evidence that claims 1–28 are unpatentable.

B. Real Parties-In-Interest

Petitioner identifies "Meta Platforms, Inc., Instagram, Inc., WhatsApp LLC, Meta Platforms Technologies, LLC, and GIPHY, Inc." as its real parties-in-interest. Pet. 2.

Patent Owner identifies "VL Collective[,] . . . VL IP Holdings LLC, which is a parent company of VL Collective, and VideoLabs, Inc., which is a parent company of VL IP Holdings LLC," as its real parties-in-interest. Paper 9, 2.

C. Related Matters

The Petition states that the '682 patent is/was the subject of the following district court proceedings: *VideoLabs, Inc.. v. Meta Platforms, Inc.*, No. 1-22-cv-00680 (D. Del.), filed May 24, 2022 (pending) ("Delaware Action") and *VideoLabs Inc. v. Amazon.com Inc.*, No. 6-22-cv-01167 (W.D. Tex.) (completed). Pet. 2.

II. THE '682 PATENT (Ex. 1001)

The '682 patent discloses extending data sent from a transmitter to include authentication data on the application level by an application protocol. Ex. 1001, code (57). The authentication data is used by the receiver to determine whether the transmitter is known by the receiver. *Id.* If the transmitter is known by the receiver, the data is accepted. *Id.* If not, the data is rejected. *Id.*

Figure 3 of the '682 patent is reproduced below.

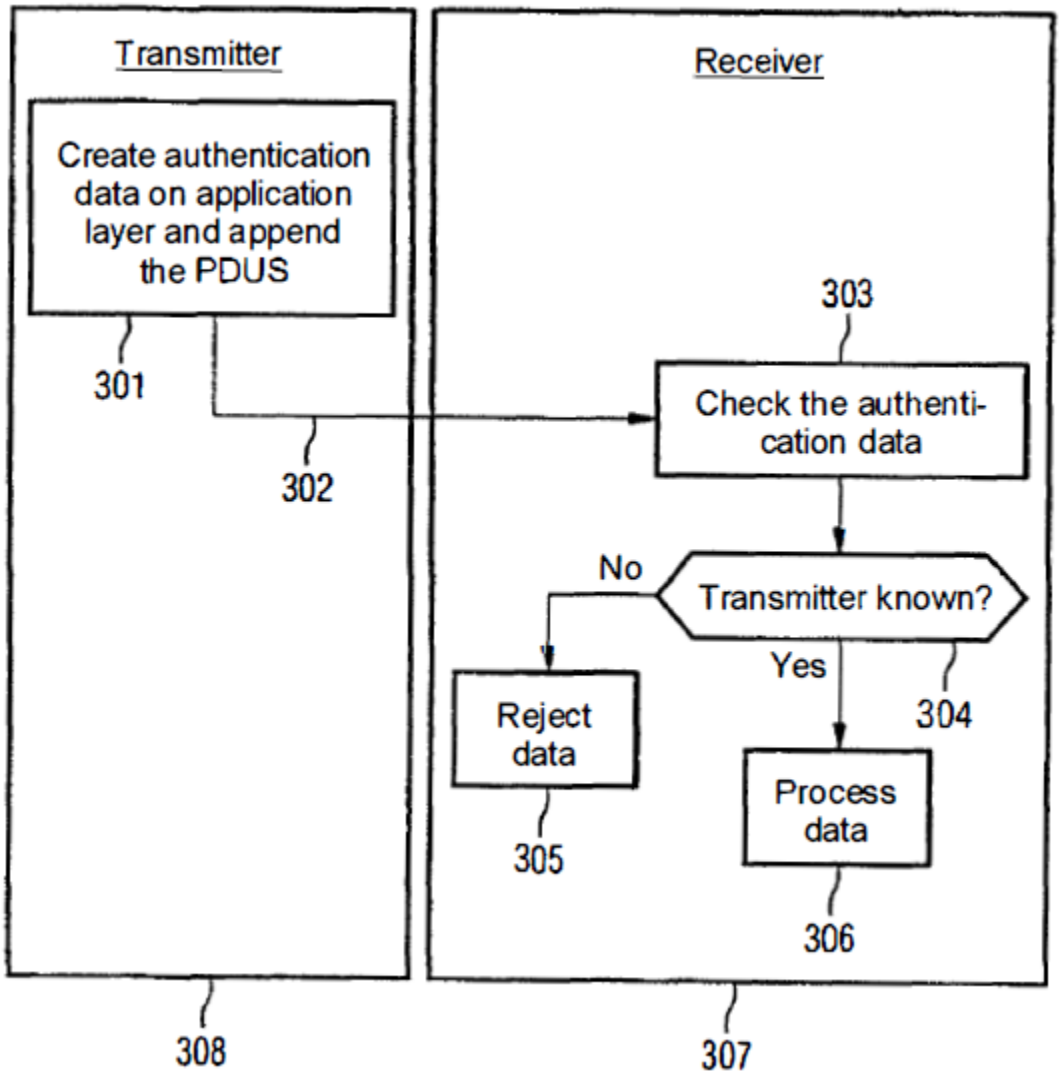

Figure 3 depicts "a flowchart for transmitting data from the transmitter 308 to the receiver 307." *Id.* at 7:6–7.

As shown in Figure 3 above, at step 301, "authentication data, are transmitted to the receiver 307 [over] connection 302 . . . using the . . . application protocol." *Id.* at 7:7–10. At step 303, "the authentication data are checked in the receiver 307." *Id.* at 7:11–14. Step 304 "determine[s] whether the transmitter 308 is known to the receiver 307." *Id.*

at 7:15–17. "If this is not the case," in step 305 "the data are rejected." *Id.* at 7:17–18. "If the transmitter 308 is known to the receiver 307," in step 306 "the data are processed further[; i.e., t]he authentication . . . was successful[] and the transmitted data are not unwanted mass data." *Id.* at 7:19–23.

Figure 4 is reproduced below.

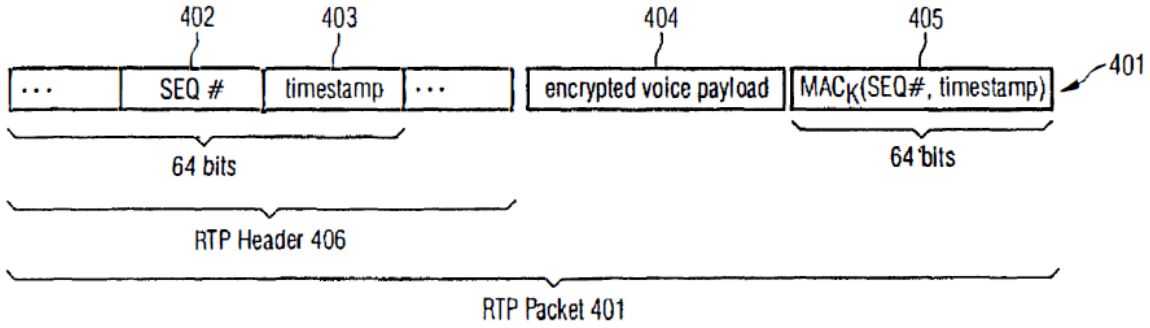

Figure 4 illustrates "a protocol data unit (PDU) of the application protocol with authentication data" and particularly "[the PDU] of the [RTP] 201 in FIG. 2." *Id.* at 7:24–27.

As shown in Figure 4 above, the PDU is an "RTP packet 401 compris[ing] an RTP header 406, encrypted media data 404 and authentication data 405." *Id.* at 7:27–29. "The RTP header 406 comprises, *inter alia*, a sequence number 402 and a timestamp 403." *Id.* at 7:29–30. "Both the transmitter and the receiver know a shared secret K, in this case indicated as a key, which is used to generate a message authentication code (MAC), [405] on the basis of the sequence number 402 and the timestamp 403." *Id.* at 7:3–34. "[S]uch a packet sent by the transmitter is authenticated at the receiver end such that (in relation to the application layer) a message authentication code is generated by field 402 (sequence number) and field 403 (timestamp) on the basis of the key (K) known to the receiver." *Id.* at 7:37–42. "If this message authentication code is the same as the field 405,

then the arriving RTP packet 401 is a data packet coming from a known transmitter, and the data are processed . . . [otherwise,] the transmitter is unknown to the receiver and the entire RTP packet is rejected." *Id.* at 7:42–48.

III. ILLUSTRATIVE CLAIM

Independent claim 1 of the '682 patent is reproduced, below, with bracketed annotations inserting Petitioner's identifiers of claim limitations (Pet. 79–83):

> [1] A method for transmitting data from a transmitter to a receiver, comprising:
>
> [1.1] providing transmitter-to-receiver authentication at a Real Time Transport Protocol (RTP) packet level as an application protocol on an application layer
>
> [1.2] by inserting, at the transmitter, authentication data at end of a whole RTP packet payload;
>
> [1.3] ascertaining, by the receiver, whether the receiver knows the transmitter based on the RTP packet level authentication data; and
>
> [1.4] accepting, by the receiver, the whole RTP packet payload, if the receiver knows the transmitter, and otherwise rejecting the whole RTP packet payload.

Ex. 1001, 7:55–67.

IV. ASSERTED GROUNDS

Petitioner asserts that claims 1–28 of the '682 patent are unpatentable on the following grounds (Pet. 5, 10–72).

Claim(s) Challenged	35 U.S.C. §[1]	Reference(s)/Basis
1–21, 23, 25–28	103(a)	Handley,[2] Basturk[3]
1–28	103(a)	PacketCable,[4] Handley
1–28	103(a)	PacketCable, Basturk
22, 24	103(a)	Handley, Basturk, PacketCable

V. LEVEL OF ORDINARY SKILL

Petitioner identifies a person of ordinary skill as someone possessing " a Bachelor's degree in computer science, electrical engineering, or a related field, and two years of experience; or . . . a Master's degree in electrical engineering or a related field, but having only one to two years of experience; or . . . no formal education but experience in network data transmission and computer networking of at least eight years. . . . EX1003, ¶45." Pet. 9. Petitioner further asserts that "[a]dditional education

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[1] The Leahy-Smith America Invents Act, Pub. L. No. 112–29, 125 Stat. 284 (2011) ("AIA"), amended 35 U.S.C. §§ 102, 103. Because the '682 patent has an effective filing date prior to the effective date of the applicable AIA amendment, we refer to the pre-AIA version of §§ 102, 103.

[2] M. Handley, J. Crowcroft, & C. Bormann, *Very Large Conferences on the Internet: The Internet Multimedia Conferencing Architecture and the MBONE*, COMPUTER NETWORKS, Feb. 11, 1999 (Ex. 1005).

[3] Erol Basturk, Mihir Bellare, Chee-Seng Chow, & Roch Guèrin, *Secure Transport Protocols for High-Speed Networks*, IBM RESEARCH REPORT RC 19981, March 1994. (Ex. 1006).

[4] *PacketCable 1.0 Architecture Framework Technical Report*, Cable Television Laboratories, Inc. ("CableLabs"), Dec. 1, 1999 (Ex. 1007).

might compensate for less experience and vice-versa." *Id.* Patent Owner does not dispute the level of ordinary skill. *See* PO Resp. 11.

The level of ordinary skill in the art usually is evidenced by the references themselves. *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). As Petitioner's description of a person of ordinary skill appears commensurate with the subject matter before us, we apply Petitioner's definition for purposes of this Decision.

VI. CLAIM CONSTRUCTION

We interpret claim terms using "the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b)." 37 C.F.R. § 42.100(b) (2019). In this context, claim terms "are generally given their ordinary and customary meaning" as understood by a person of ordinary skill in the art in question at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (citations omitted) (en banc). "In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence." *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). Extrinsic evidence is "less significant than the intrinsic record in determining 'the legally operative meaning of claim language.'" *Phillips*, 415 F.3d at 1317 (citations omitted). Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

Petitioner "present[s] no terms for construction and further submits that the Board does not need to construe any claim term for purposes of evaluating the prior art in this Petition." Pet. 9. Patent Owner contends that the term "application layer" recited in claim 1 should be construed as "the layers above the transport layer (layers above 4)." PO Resp. 14. Patent Owner contends that the term "application protocol" recited in claim 1 should be construed as "the protocol for communication between a transmitter application layer situated above the transport layer and a receiver application layer situated above the transport layer." *Id.*; *see also id.* at 14–18. Petitioner contends that even under Patent Owner's proposed construction of "application layer" and "application protocol," the references asserted in the Petition render obvious all challenged claims. Reply 1 (citing Ex. 1033 ¶ 10).

We construe only those claim terms that require analysis to determine whether to institute *inter partes* review. *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"). We do not need to construe any term in order to resolve a dispute because under either plain meaning or Patent Owner's proposed construction, Petitioner has shown that the prior art renders the challenged claims obvious as discussed below.

VII. ANALYSIS

A. Legal Standards

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363

(Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")); *see also* 37 C.F.R. § 42.104(b) (2019) (requiring a petition for *inter partes* review to identify how the challenged claim is to be construed and where each element of the claim is found in the prior art patents or printed publications relied upon).

A claim is unpatentable under 35 U.S.C. § 103(a) if "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, objective evidence of obviousness or nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). An obviousness analysis "need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR*, 550 U.S. at 418.

Additionally, the obviousness inquiry typically requires an analysis of "whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring "articulated

reasoning with some rational underpinning to support the legal conclusion of obviousness")). Furthermore, Petitioner does not satisfy its burden of proving obviousness by employing "mere conclusory statements," but "must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

B. Claims 1–21, 23, and 25–28 as Obvious over Handley and Basturk

1. Handley – Exhibit 1005

a. Publication Date

The parties agree that the effective filing date of the '682 patent is January 18, 2000. Pet. 4; PO Resp. 5. In arguing that Handley is not prior art, Patent Owner contends (1) that Petitioner forfeited the right to rely on supplemental evidence in showing that Handley was publicly accessible before the effective filing date of the '682 patent, and (2) that the supplemental evidence proves that Handley is not prior art. PO Sur-Reply 2–10.

Contentions for the Right to Rely on Supplemental Evidence

The Petition specifically states that Handley was published February 11, 1999, in the Computer Networks journal, and cites to the Declaration of Dr. Houh, which states the same and also provides a detailed overview of the prior art, including Handley. Pet. 4 (citing Ex. 1003 ¶¶ 59–61). In its Preliminary Response, Patent Owner challenged the prior art status of Handley and PacketCable. Prelim. Resp. 33–36, 40–41. In response to Patent Owner's challenge, Petitioner filed a Motion to Submit Supplemental Information (Paper 21, "Motion"). With its Motion, Petitioner filed Exhibits 1016–1028 as supplemental information that "relates exclusively to the prior

art status of Exhibit 1005 ('Handley') and Exhibit 1007 ('PacketCable')." Motion 1. We granted the Motion (Paper 28, "Order") and accepted Exhibits 1016–1028 into evidence. In granting the Motion, "[w]e agree[d] with Petitioner that Exhibits 1016–1018 and 1020–1028 confirm that Exhibit 1005 was publicly accessible by February 11, 1999." Order 3. We also stated that "Patent Owner is able to argue any publication or evidentiary issues collectively with respect to Exhibits 1005, 1007, and 1016–1028 in the normal course of scheduled briefing." *Id.* at 6.

We issued the Order after Patent Owner filed its Patent Owner's Response and before Petitioner filed its Reply. In its Reply, Petitioner contends that the Board confirmed that Handley was publicly accessible by February 11, 1999. Reply 2 (citing Paper 28, 3).

In its Patent Owner's Sur-Reply, Patent Owner contends that Petitioner does not cite the supplemental information regarding Handley in Reply, and forfeits the right to rely on it. PO Sur-Reply 3. Patent Owner contends that Petitioner improperly relied on statements made by the Board in the Order granting the Motion to conclude that the Board decided that Handley qualifies as prior art, because the Order stated that "Patent Owner is able to argue any publication or evidentiary issues . . . in the normal course of scheduled briefing." *Id.* (quoting Paper 28, 6). Patent Owner cites several cases to support its contention that the Board should not consider arguments presented in the Motion, which is outside of the Petition and Petitioner's Reply, because the Board must base its decision on arguments that were advanced by a party, and to which the opposing party was given a chance to respond. *Id.* at 3–4.

In the Motion, Petitioner contended that "[t]his supplemental information relates exclusively to the prior art status of Exhibit 1005 ('Handley') and Exhibit 1007 ('PacketCable')." Motion, 1. Petitioner contended that it "now seek[s] to submit supplemental information further demonstrating the prior art status and public accessibility of both Handley and PacketCable." *Id.* at 2. Petitioner contended that "[e]ach exhibit submitted with this Motion is relevant . . . to the public accessibility of Handley and PacketCable." *Id.* at 4. Petitioner contended that "Exhibits 1016–1018 and 1020–1028 further confirm that Handley was available to the public and is, therefore, prior art." *Id.* at 4–6 (Petitioner explaining how the cited Exhibits show that Handley qualifies as prior art.). Patent Owner disagreed with Petitioner's contentions in the Motion that Handley qualifies as prior art in Patent Owner's Opposition (Paper 28, 6–15) and Patent Owner's Sur-Reply (PO Sur-Reply 2–10).

Analysis for the Right to Rely on Supplemental Evidence

In the Order, we stated that "[w]e agree with Petitioner that Exhibits 1016–1018 and 1020–1028 confirm that Exhibit 1005 was publicly accessible by February 11, 1999." Order, 3–4. We also stated that "[w]e also agree with Petitioner that Exhibits 1027 and 1028 are not new documents that replace Exhibit 1005. Rather, these exhibits are supplemental information that provide evidence as to the public availability of Exhibit 1005." *Id.* at 4. We further stated that "Patent Owner raised publication issues with respect to Exhibits 1005 and 1007 in its Preliminary Response, and Petitioner responded with the Motion. Moreover, Patent Owner is able to argue any publication or evidentiary issues collectively

with respect to Exhibits 1005, 1007, and 1016–1028 in the normal course of scheduled briefing." *Id.* at 6.

We find that Patent Owner had notice about how Petitioner believes that the supplemental information confirms that Handley qualifies as prior art. Petitioner, in the Motion, explicitly contended that the supplemental information demonstrates the public accessibility of Handley, and explained how "Exhibits 1016–1018 and 1020–1028 further confirm that Handley was available to the public and is, therefore, prior art." Motion, 1–6. We find that our statements in our Order gave Patent Owner (a) notice that we agreed with Petitioner's contentions that Exhibits 1016–1018 and 1020–1028 confirm that Handley qualifies as prior art, (b) notice of our reasoning why we agreed with Petitioner, and (c) notice of our reasoning why we disagreed with Patent Owner's contentions to the contrary in the Opposition. Order, 1–6. We find that our Order also gave Patent Owner notice that Patent Owner had an opportunity to respond to our statements and reasoning in the Order by stating that "Patent Owner is able to argue any publication or evidentiary issues . . . in the normal course of scheduled briefing." *Id.* at 6. We find that Patent Owner had an opportunity to respond to Petitioner's contentions in the Motion in Patent Owner's Opposition and Patent Owner's Sur-Reply.

We disagree with Patent Owner's contentions that: (a) Petitioner failed to argue that Handley is prior art in the pertinent papers; (b) the Board could not have ruled that Handley is prior art in the Motion; (c) Petitioner does not claim to incorporate its arguments from the Motion into the Reply; and (d) Petitioner simply placed Exhibits 1016–1018 and 1020–1028 in the record. PO Sur-Reply 2–4. We find that in the Motion, Petitioner explicitly

argued that Handley is prior art, and that Exhibits 1016–1018 and 1020–1028 confirm that Handley is prior art. Motion 1–2, 4–6. Further, in the Order, the Board explicitly made an interlocutory decision agreeing with Petitioner that Exhibits 1016–1018 and 1020–1028 confirm that Handley is prior art. Order 3–4. The fact that Petitioner, in Reply, cited to our interlocutory decision rather than repeat the same arguments from the Motion does not deprive Patent Owner of notice and opportunity to respond. This is especially true here, where we explicitly agreed with Petitioner, where Patent Owner had an opportunity to respond in its Opposition, and where we explicitly stated in our Order that Patent Owner has an opportunity to respond in the normal course of briefing.[5] *Id.* at 6.

The cases cited by Patent Owner are not persuasive. For example, here, unlike in *Parus*, Petitioner did not simply place Exhibits 1016–1018 and 1020–1028 in the record without explanation. *See Parus Holdings, Inc. v. Google LLC*, 70 F.4th 1365, 1372 (Fed. Cir. 2023). Rather, Petitioner persuasively explained how Exhibits 1016–1018 and 1020–1028 confirm that Handley is prior art. Motion 4–6. Furthermore, here, unlike *Magnum Oil Tools*, we are not "adopt[ing] arguments that could have been, but were not, raised by petitioner during an IPR." *In re Magnum Oil Tools*, 829 F.3d at 1381 (Fed. Cir. 2016). Rather, we "base [our] decision on arguments that were advanced by a party, and to which the opposing party was given [multiple] chance[s] to respond." *Id.*

[5] Patent Owner also could have requested additional briefing and chose not to do so.

Given that the Motion explicitly raised Petitioner's contention that Exhibits 1016–1018 and 1020–1028 confirm that Handley qualifies as prior art, that Patent Owner had an opportunity to respond in the Opposition, that our Order explicitly stated that we agree with Petitioner that Exhibits 1016–1018 and 1020–1028 confirm that Handley qualifies as prior art, that our Order explained why we disagreed with Patent Owner's contentions in the Opposition, and that our Order explicitly stated that Patent Owner had an opportunity to respond, we find that Patent Owner had notice and opportunity to respond to Petitioner's contention that Exhibits 1016–1018 and 1020–1028 confirm that Handley is prior art, that Patent Owner had notice and opportunity to respond to our interlocutory decision agreeing with Petitioner, and that Patent Owner had notice and opportunity to respond to Petitioner's reliance on our interlocutory decision. We find that Petitioner properly relied on our interlocutory decision in its Reply. 37 C.F.R. § 42.71(b) ("A decision on a motion without a judgment is not final for the purposes of judicial review . . . . A panel decision on an issue will govern the trial."); 77 FR 48669, 48624 ("The rule makes clear that a decision short of judgment is not final, but a decision by a panel would govern the trial. Experience has shown that the practice of having panel decisions bind further proceedings has eliminated much of the uncertainty and added cost that result from deferring any final decision until the end of the proceeding.").

Contentions for Whether Handley is Prior Art

We now turn to Patent Owner's arguments in its Sur-Reply contending that "the supplemental evidence further confirms that Handley (EX1005) is not prior art." PO Sur-Reply 4–5. Patent Owner's arguments

are based on the fact that Handley (Ex. 1005) (filed with the Petition) is a draft version of Exhibit 1028 (filed as supplemental evidence), which is the version of Hadley published in the Computer Networks journal. *See* Mot. 4–6; PO Sur-Reply 5.

Patent Owner contends that Exhibit 1028 is what was actually published in the Computer Networks journal on February 11, 1999. PO Sur-Reply 5. Patent Owner contends that Exhibit 1028 is materially different than Handley, because Exhibit 1028 has a different title, authorship, and substantive content. *Id.* (citing Ex. 2003). Patent Owner contends that Exhibit 1005 is different from Exhibit 1028 because, as Dr. Crowcroft, an author of Handley (Exhibit 1005), states, Exhibit 1005 is a draft version of the article that eventually published in the Computer Networks journal as shown in Exhibit 1028, and that there are differences between Exhibit 1005 and Exhibit 1028. *Id.* at 5–6 (citing Ex. 1016 ¶¶ 13–18). Patent Owner also contends that Dr. Houh's declaration indicates that Exhibit 1005 is a version of an article before being published in the Computer Networks journal that led to the publication of Exhibit 1028 in the Computer Networks journal, which, according to Patent Owner, further confirms that Exhibit 1005 was not published in the Computer Networks journal. *Id.* at 6 (citing Ex. 1017 ¶ 13).

In its Motion, Petitioner contended that "Exhibit 1018 is a supplemental declaration from Dr. Sylvia Hall-Ellis, a librarian expert . . . testifying that, as of February 11, 1999, Handley was publicly accessible in the Computer Networks journal." Motion 4–5. Petitioner contended that "Exhibit 1016 is a declaration from Dr. Jon Crowcroft, a named co-author of Handley, testifying that, as of February 11, 1999, Handley was publicly

accessible." *Id.* at 5. Petitioner contended that "Exhibit 1017 is a supplemental declaration from Dr. Henry Houh, testifying that Handley was publicly accessible as of February 11, 1999." *Id.*

In our Order, we said that Dr. Crowcroft "testifies that Exhibit 1005 was published in Computer Networks on February 11, 1999 as shown in Exhibits 1027 and 1028. Ex. 1016 ¶¶ 15–16." Order 4. We agreed with Petitioner that Exhibits 1027 and 1028 are not new documents that replace Exhibit 1005, but are supplemental information that provide evidence as to the public availability of Exhibit 1005. *Id.* We stated that "[t]o the extent that Exhibits 1005, 1027, and 1028 have minor differences as shown by Exhibit 2003, the differences do not bear on the subject matter of Exhibit 1005 relied on in the Petition." *Id.* We relied on Dr. Crowcroft's testimony that "the technical substance of EX1005, 1027, and 1028 are identical," that "it is common practice for editors and publishers to edit citations, grammar, and non-substantive text" and "[t]his is what happened with EX1005," and that "the version published as EX1028 . . . is identical to EX 1005 for all intents and purposes." *Id.* (citing Ex. 1016 ¶¶ 16, 18).

We also said that "Dr. Houh testifies that the teachings of Exhibit 1005 are fully included in Exhibits 1027 and 1028," that we "agree with Dr. Houh, that 'every citation to EX1005 in [the] Petition [] and in [Dr. Houh's] supporting declaration (EX1003) [are] fully included in both EX1027 and EX1028." Motion 4 (citing Ex. 1017 ¶ 12). We said that "we agree with Petitioner, that Exhibits 1027 and 1028 show that the teachings of Exhibit 1005 relied on in the Petition were published in Computer Networks on February 11, 1999." *Id.*

Analysis for Whether Handley is Prior Art

We agree with Dr. Crowcroft, Dr. Houh, and Dr. Hall-Ellis and find that Exhibit 1028 was published and publicly accessible in the Computer Networks journal on February 11, 1999, which is before the '682 patent's effective filing date of January 18, 2000. Ex. 1016; Ex. 1017; Ex. 1018. The issue is thus whether Exhibit 1028 shows that the subject matter of Exhibit 1005 relied on in the Petition was publicly accessible in the Computer Networks journal as of February 11, 1999.

Patent Owner contends that Exhibit 1028 is a different document than Exhibit 1005 relied on in the Petition because, according to Patent Owner, "EX1028 has a different title, authorship, and substantive content than Handley." PO Sur-Reply 5 (citing Ex. 2003). Patent Owner contends that Dr. "Crowcroft also confirmed that there are 'differences' between EX1005 and a different 'version' (EX1028)," and that Dr. "Houh's declaration also indicates that EX1005 is a 'version' of an article '*before* being formally published in Computer Networks.'" PO Sur-Reply 5–6 (citing Ex. 1016 ¶¶ 15–16; Ex. 1017 ¶ 13).

The Federal Circuit stated that an "Exhibit may be authenticated by a comparison with an authenticated specimen by an expert witness or the trier of fact." *Valve Corp. v. Ironburg Inventions, Ltd.*, 8 F.4th 1364, 1371 (Fed. Cir. 2021). Dr. Houh testifies that "I have prepared Attachment 1, which lists all relied upon citations from EX1005, where they are located in EX1005, and where they are located both in Petition and in my supporting declaration EX1003. In parallel, Attachment 1 also lists citations from EX1027 and EX1028 that are identical to those found in EX1005." Ex. 1017 ¶ 12. We have also compared the citations from Exhibit 1005

relied on in the Petition and found that the citations are identical to those found in Exhibits 1027 and 1028. Therefore, we agree with Dr. Houh that the subject matter described in Exhibit 1005 as relied on in the Petition is identically described in Exhibits 1027 and 1028. Ex. 1017 ¶ 12; *see also* Ex. 1016 ¶ 18 (Dr. Crowcroft testifying that "the version published as EX1028 (which is identical to EX1027) is identical to EX1005 for all intents and purposes."). As we found in our Order, although "Exhibits 1005, 1027, and 1028 have minor differences as shown by Exhibit 2003, the differences do not bear on the subject matter of Exhibit 1005 relied on in the Petition." Order 4.

Patent Owner does not rebut this persuasive evidence with evidence or argument to the contrary. The minor differences between Exhibit 1005 and Exhibits 1027 and 1028 identified by Patent Owner in Exhibit 2003 "do[] not bear on the subject matter being disclosed" in Exhibit 1005 and cited in the Petition, "which is identical in" Exhibits 1027 and 1028. *Valve Corp.*, 8 F.4th at 1371; *cf. VidStream LLC v. Twitter, Inc.*, 981 F.3d 1060, 1066 (Fed. Cir. 2020) ("VidStream stresses that the Board did not link the 2015 copy of Bradford with the evidence purporting to show publication in 2011."). Here, unlike in *Vidstream*, based on Petitioner's showing, we link the subject matter of Exhibit 1005 relied on in the Petition with evidence showing its publication in 1999. Therefore, we disagree with Patent Owner's contention. We find that the minor differences between Exhibit 1005 and Exhibits 1027 and 1028 do not prevent Petitioner from showing that the subject matter of Exhibit 1005 relied on in the Petition was published in the Computer Networks journal on February 11, 1999. We find that Petitioner, Dr. Crowcroft, and Dr. Houh persuasively show that the subject matter of

Exhibit 1005 relied on in the Petition was publicly available in the Computer Networks journal as of February 11, 1999, as shown by Exhibits 1027 and 1028.

Petitioner presents an alternative contention that Exhibit 1005 was publicly available before the effective filing date of the '682 patent because Dr. Crowcroft uploaded Exhibit 1005 to a publicly accessible website and a publicly accessible server. Motion 5. However, we need not reach Petitioner's alternative contention in order to find that Exhibit 1005 was publicly accessible before the effective filing date of the '628 patent. The issue of whether Exhibit 1005 posted on Dr. Crowcroft's website was publicly accessible is moot because the subject matter of Exhibit 1005 was published in *Very Large Conferences on the Internet: The Internet Multimedia Conferencing Architecture and the MBONE*, on February 11, 1999, in the Computer Networks journal. Ex. 1027; Ex. 1028; Ex. 1016 ¶¶ 16, 18; Ex. 1017 ¶ 12; Ex. 1018 ¶ 47. Therefore, we do not need to resolve the dispute over the alternative contention.

In our Order we agreed, and we continue to agree, with Petitioner that Exhibits 1027 and 1028 are not new documents, but are supplemental information that provide evidence as to the public availability of the subject matter of Exhibit 1005. Order 4. Further, the Petition cited the journal article to show public accessibility of Exhibit 1005, thus providing Patent Owner (a) notice that the subject matter of Exhibit 1005 was publicly accessible in the journal article and (b) an opportunity to respond. Pet. 4. We agreed and continue to agree with Dr. Houh that every citation to Exhibit 1005 in the Petition and in Dr. Houh's supporting declaration (Ex. 1003) are fully included in both Exhibit 1027 and Exhibit 1028. *Id.* (citing

Ex. 1017 ¶ 12). We relied and continue to rely on the declarations of Dr. Crowcroft and Dr. Houh in "agree[ing] with Petitioner, that Exhibits 1027 and 1028 show that the teachings of Exhibit 1005 relied on in the Petition were published in Computer Networks on February 11, 1999." *Id.*; Ex. 1016 ¶ 16 (Dr. Crowcroft testifies that "the technical substance of EX1005, 1027, and 1028 are identical."), ¶ 18; Ex. 1017 ¶ 12. We agree with Dr. Crowcroft in finding that "the version published as EX1028 (which is identical to EX1027) is identical to EX1005 for all intents and purposes." Ex. 1016 ¶ 18.

We are not persuaded by Patent Owner's reliance on *In re Klopfenstein*, 380 F.3d 1345 (Fed. Cir. 2004). PO Sur-Reply 9 (citing *Klopfenstein* n.4). Footnote 4 of *Klopfenstein* states that "a presentation that includes a transient display of slides is . . . not necessarily a 'printed publication.'" Footnote 4 of *Klopfenstein* is irrelevant to the Petition in this case, which does not rely on an oral proceeding that includes a transient display of slides, but rather a journal publication, to show that Exhibit 1005 is prior art. Neither Exhibit 1005, Exhibit 1027, nor Exhibit 1028 is transient.

We rely on the testimony of Dr. Crowcroft and Dr. Houh in finding that although Exhibits 1005, 1027, and 1028 have minor differences as shown by Exhibit 2003, the differences do not bear on the subject matter of Exhibit 1005 relied on in the Petition. We find that the subject matter of Exhibit 1005 relied on in the Petition was publicly available in the Computer

Networks journal as of February 11, 1999, as evidenced by Exhibits 1027 and 1028, and is therefore prior art.[6]

b. Teachings of Handley

Handley "provide[s] an overview of multimedia conferencing on the Internet." Ex. 1005, 1. Handley discloses that "[t]he Internet is not currently very good at carrying audio and video[; t]his is hardly surprising as it was not designed or engineered with real-time traffic in mind." *Id.* Handley denotes "the real interest in using the internet . . . for a single ubiquitous communications network that not only allows traditional telephony services, but also video, shared collaboration tools, and through IP Multicast, multi-party conferences and multimedia sessions that scale from small group meetings through to television sized audiences." *Id.* Handley overviews "the basic technologies . . . [thought] likely to bring about such changes." *Id.*

Handley discloses that in a conference, "information must be distributed to all the conference participants." Ex. 1005, 2. Handley discloses:

> In addition, *security* measures may be required to actually enforce the conference policy, e.g.[,] to control who is listening and to authenticate contributions as actually originating from a specific person. In the Internet, there is little tendency to rely on the traditional "security" of distribution offered by the phone

[6] The Dissent does not adequately address the fact that the Petition and Dr. Houh specifically state that Handley was published in the Computer Networks journal and the related fact that Petitioner shows that there is no substantive difference between the Ex. 1005 and Ex. 1028 versions of Handley. Under the Dissent's theory, an article submitted to, and edited by, a journal publisher, is a wholly different document than the submitted document to the extent that notice of both does not support notice of either.

> system. Instead, cryptographic methods are used for encryption and authentication, which need to be supported by additional conference setup and control mechanisms (section 8).

Id.

Handley discloses that the "transport protocol for real-time flows is RTP." Ex. 1005, 8. Handley discloses that RTP "provides a standard format packet header which gives media specific timestamp data, as well as payload format information and sequence numbering amongst other things." *Id.*

With respect to security, Handley discloses that "[i]f the application requirement (conference policy) is to communicate between some defined set of users, then strict privacy can only be enforced in any case through adequate end-to-end encryption." Ex. 1005, 12. "RTP specifies a standard way to encrypt RTP and RTCP packets using private key encryption schemes such as [the Data Encryption Standard (DES)]." *Id.* Handley discloses that "[k]ey distribution is closely tied to authentication." *Id.* "[S]ecured broadcasts can be performed by encrypting a hash (digitally signing) of each packet with the sender[']s private key of a public-private key pair. The public key is then given to the receivers, and they discard (and prune if possible) any packets that are unsigned." *Id.* at 13.

2. Basturk – Exhibit 1006

a. Publication Date

Petitioner, relying on the testimony of Dr. Sylvia Hall-Ellis, contends that Basturk was publicly available on September 1, 1995. Pet. 5 (citing Ex. 1010). Dr. Hall-Ellis, who has been involved in the field of library sciences for over fifty years, testifies that Basturk was publicly available on September 1, 1995. Ex. 1010 ¶¶ 6, 64. Patent Owner does not challenge the

status of Basturk as prior art. We agree with Dr. Hall-Ellis and find that Basturk was published before the effective filing date of the '682 patent.

b. Teachings of Basturk

Basturk discloses that the increasingly widespread use of networks is leading to new security concerns such as secure delivery. Ex. 1006, Abstract. Basturk discloses that application level security features are usually provided by application level security, where the sender applies cryptographic functions to data before passing it to the transport for conveyance. *Id.* at 3. Basturk discloses that integrity is usually guaranteed by signing the data before passing it to the transport level. *Id.* at 3–4.

Basturk discloses providing the standard application level security features as options. Ex. 1006, 5. Basturk discloses that if the integrity option is selected, then data is signed under the session key. *Id.* at 9. On receiving a signed packet, the receiver uses the session key to verify the signature, or message authentication code (MAC). *Id.* Basturk discloses keeping the overhead involved in computing the signature to a minimum by computing the signature on-the-fly; i.e., MAC generation is carried out as data transmission proceeds. *Id.* at 12. Basturk discloses that this avoids slowing down the regular flow of data, and allows off-loading signature computations to dedicated hardware. *Id.*

Basturk discloses that encryption is done prior to packetization, and the signature of an outgoing packet is computed after data encryption, which complies with computing the signature "on the fly." Ex. 1006, 14. Basturk discloses that "[f]ollowing data, a trailer [is] added [to the packet] that contains the packet signature." *Id.* at 16. Basturk discloses that if the

signature checking fails at the receiver, then the packet is corrupted, and the packet is simply dropped. *Id.* at 14.

3. Reasons to Combine the Teachings of Handley and Basturk

Petitioner contends a person of ordinary skill in the art (POSITA) would have had reason to combine the teachings of Handley and Basturk because:

> Although Handley does not expressly disclose "inserting, at the transmitter, authentication data at [the] end of a whole RTP packet payload" . . . . A POSITA would have been motivated to use Basturk's "on-the-fly" signature computation with *Handley's* internet conferencing architecture due to the known communication benefits, which include faster data transmission, reduced jitter, and reductions in computing power. EX1003, ¶64.

Pet. 10.

Contentions for Reasons to Combine

Patent Owner contends that Basturk's statement that "MAC generation should be carried out as data transmission proceeds rather than before these operations have completed" is not referring to computing a MAC while the packet is being transmitted. PO Resp. 24–25 (citing Ex. 2004 ¶¶ 106–107). According to Patent Owner, Basturk is referring to computing the MAC while retrieving context data for performing cryptographic operations. *Id.* Patent Owner contends that a signature for a packet will always have to be computed before passing the packet's protocol data unit (PDU) to the next layer. *Id.* at 25 (citing Ex. 2004 ¶ 108).

Patent Owner contends that Basturk's secure transport protocol is a transport level protocol that operates at the transport layer, not the application layer. PO Resp. 26 (citing Ex. 2004 ¶ 110). Patent Owner contends that Basturk discloses implementing its security features so that

applications using the regular transport protocol will not have to be modified at all." *Id*. According to Patent Owner, Basturk accomplishes that goal by not implementing its security features at the application layer. *Id*. (citing Ex. 2004 ¶ 110).

Patent Owner contends that Handley's RTP over UDP (User Datagram Protocol) is incompatible with Basturk's transport protocol, which is an extension of the transport level reliability feature. PO Resp. 26–27 (citing Ex. 2004 ¶ 111). Patent Owner contends that Basturk's increase in reliability, which is the ability to recover from damaged or lost data, is achieved through timeout and retransmission policies that comes at the cost of delay, similar to that other reliability protocols such as TCP. *Id*. at 27–28 (citing Ex. 2004 ¶¶ 111–112).

Patent Owner contends that Handley teaches away from using reliability protocols like Basturk's for transmitting RTP traffic. PO Resp. 28. In particular, Patent Owner contends that Handley's RTP, which is a real-time protocol, is incompatible with Basturk's reliability protocol because Handley discloses that TCP traffic is non-real-time traffic due to the delay caused by the reliability features. *Id*. (citing Ex. 2004 ¶ 113). Patent Owner contends that Handley implements real-time traffic using RTP over UDP, which is not a reliable delivery protocol, and gives the RTP over UDP traffic a higher priority than the TCP traffic. *Id*. at 28–29 (citing Ex. 2004 ¶¶ 113–114). Patent Owner contends that Basturk's reliable delivery protocol is therefore unsuitable for transporting Handley's RTP traffic. *Id*.

Patent Owner contends that Basturk's reliability protocol is incompatible with Handley's RTP because Basturk's reliability protocol requires a direct connection between two endpoints, but Handley's RTP

relies on a multicast network for delivery of packets. *Id*. at 29–30 (citing Ex. 2004 ¶ 115). Patent Owner contends that Basturk's reliability protocol would have been incompatible with Handley's RTP because of delays caused by acknowledgements and retransmissions. *Id*. at 30 (citing Ex. 2004 ¶ 116). Patent Owner contends that Basturk teaches away from modifying Handley's application layer with Basturk's transport protocol. PO Resp. 30. Patent Owner contends that Basturk states that its design reflects the need to add security in a way that is consistent with the existing communication structure and that applications using the regular transport protocol should not have to be modified. *Id*. at 30–31 (citing Ex. 1006, 3, 5). Patent Owner contends that Basturk indicates that implementing its security features at the application level would be poor design and would degrade performance. *Id*. at 31 (citing Ex. 1006, 4 n.3, 12; Ex. 2004 ¶ 117–118).

Petitioner contends that Basturk discloses that "we want signatures to be computed and verified on-the-fly; i.e., MAC generation (verification) should be carried out as data transmissions (receptions) proceeds rather than before (after) these operations have completed." Reply 4 (quoting Ex. 1006, 12) (emphasis omitted). Petitioner contends that a person of ordinary skill in the art would have understood that this statement means (1) "we want signatures to be computed on-the-fly; i.e., MAC generation should be carried out as data transmissions proceeds rather than before these operations have completed" and (2) "we want signatures to be verified on-the-fly; i.e., MAC verification should be carried out as data receptions proceeds rather than after these operations have completed." *Id*. (quoting Ex. 1033 ¶ 12). Petitioner contends that a person of ordinary skill in the art would have understood Basturk's phrase "these operations" to refer to the data

transmission and reception, not to the MAC generation and verification. *Id.* at 5 (citing Ex. 1033 ¶ 14). Petitioner contends that a person of ordinary skill in the art would have understood Basturk's phrase "on-the-fly" means, in part, "the process of computing the MAC in parallel to the transmission of the packet." *Id.* (citing Ex. 1033 ¶¶ 11–14). Petitioner contends that Patent Owner's interpretation of "on-the-fly" means computing the MAC while retrieving context data for performing cryptographic operations does not make sense for data transmission because Basturk discloses that context information is immediately available during data transmission. *Id.* (citing Ex. 1006, 6; Ex. 1033 ¶ 14).

Petitioner contends that Patent Owner's contention that a signature for a packet will always have to be computed before passing the packet's protocol data unit (PDU) to the next layer (PO Resp. 25) is not correct, because "in practice, many applications do not always permit exact nomination of strict boundaries, specifically between the upper protocol layers, particularly layers 5 to 7." Reply 5–6 (quoting Ex. 1001, 1:37–45; Ex. 1033 ¶ 22). Petitioner relies on Dr. Houh's testimony in contending that, "[i]f all functions at one layer had to be completed prior to passing data down to the next layer, the lower layer would not need to work in conjunction with the upper layer and instead could perform its own function independently." *Id.* at 6 (quoting Ex. 1033 ¶ 24). In further support, Petitioner cites to Basturk's disclosure of "allow[ing] the possible off-load of signature computations and verifications to dedicated hardware" to show, contrary to Patent Owner's contention, that passing data to a lower layer before computing the signature was within the level of ordinary skill in the art. *Id.* at 6–7 (citing Ex. 1006, 12; Ex. 1033 ¶¶ 25–26).

Petitioner contends that Patent Owner improperly relies on bodily incorporation of Basturk's reliability protocol with Handley's RTP conferencing architecture. Reply 8. Petitioner contends that the Petition states that a person of ordinary skill in the art would have used Basturk's teaching of computing a signature "on-the-fly" with Handley's internet conferencing architecture. *Id*.

Petitioner further contends that Basturk teaches "Secure Transport Protocols for High-Speed Networks" which are focused on secure delivery. *Id*. at 9 (citing Ex. 1033 ¶¶ 31–33). Petitioner contends that the reliability described in Basturk serves the purpose of authenticating the sender of data, which is not a feature of protocols such as TCP. *Id*. at 9–10 (citing Ex. 1033 ¶ 31). Petitioner contends that a person of ordinary skill in the art would have understood that Basturk's authentication technique would have prevented unauthorized interruption of video transmissions such as that of the Rolling Stones concert described in Handley. *Id*. at 10–11 (citing Ex. 1005, 13; Ex. 1033 ¶ 33).

Petitioner contends that Basturk's secure transport protocol is compatible with Handley's internet conferencing architecture because Basturk's "on-the-fly" technique for computing the signature does not add latency to the data transmission because computing the signature occurs in parallel with transmission. Reply 11–13 (citing Ex. 1033 ¶¶ 34–35). Petitioner contends that the signature computed "on-the-fly" can be inserted at the end of the packet and transmitted within Handley's delay bounds of a few hundred milliseconds. *Id*. (citing Ex. 1033 ¶¶ 34–35; Ex. 1005, 4–5).

Petitioner contends that Patent Owner's contention that Basturk's use of acknowledgements would cause delays and thus would be incompatible

with Handley's real-time conferencing architecture misinterprets Ground I of the Petition. Reply 13 (citing PO Resp. 30). Petitioner contends that Ground I is based on the combination of Basturk's "on-the-fly" authentication techniques and Handley's internet conferencing architecture. *Id*. (citing Ex. 1033 ¶ 38). Petitioner contends that a person of ordinary skill in the art would have understood Basturk's teaching of integrity via signing using the "on-the-fly" technique to mean any data is signed using the "on-the-fly" technique, even data that does not require an acknowledgement. *Id*. at 14.

Patent Owner contends that Dr. Houh testified that during "on-the-fly" processing, generating and inserting the signature happens at a lower layer, not at the application layer. PO Sur-Reply 16–17 (citing Ex. 2010, 66:1–9, 108:10–110:9, 116:18–119:16). Patent Owner contends that claim 1 requires "providing authentication 'by inserting . . . authentication data at end of a whole RTP packet payload' specifically 'as an application protocol on an application layer,' not at the physical or lower layer." *Id*. at 17. Patent Owner contends that computing and inserting a signature at a physical layer defies the principle of generating a PDU at a higher layer and encapsulating at a lower layer. *Id*. (citing Ex. 2004 ¶¶ 30–35; Ex. 2010, 153:3–154:2, 161:22–164:9).

Patent Owner contends that although strict boundaries do not exist within the application layers 5 through 7, the '682 patent distinguished between the application layers about layer 4 and lower layers. PO Sur-Reply 18. Patent Owner contends that Basturk teaches adding security to reliability, which makes Basturk's protocol incompatible with the protocol of Handley. *Id*. at 18–19. Patent Owner contends that because Handley

does not disclose using signatures for authentication, a person of ordinary skill in the art would not have computed Basturk's "on-the-fly" signature in Handley's architecture. *Id*. at 19.

Analysis of Contentions for Reasons to Combine

We disagree with Patent Owner's contention that Basturk's statement that "MAC generation should be carried out as data transmission proceeds rather than before these operations have completed" is not referring to computing a MAC while the packet is being transmitted. *See* PO Resp. 24–25 (citing Ex. 2004 ¶¶ 106–107). Rather, we agree with Petitioner and find that a person of ordinary skill in the art would have understood Basturk's phrase "on-the-fly" means, in part, the process of computing the MAC in parallel to the transmission of the packet. Reply 4 (citing Ex. 1033 ¶¶ 11–14). Given the conflicting testimony between Dr. Houh and Dr. Stubbelbine, we find Dr. Houh's testimony credible, because Dr. Houh's testimony is consistent with the disclosure of Basturk. We agree with Dr. Houh and find that "Dr. Stubblebine's understanding of 'on-the-fly' does not conform whatsoever with the teachings of Basturk." Ex. 1033 ¶ 14 (citing Ex. 2004 ¶¶ 106–107). We agree with Dr. Houh and find that a person of ordinary skill in the art "would have understood that generation of the MAC as data transmission proceeds matches Basturk's teaching that '[i]n all instances we would like all computations to be carried out 'on-the-fly' as data is being transmitted or received. This minimizes latency.'" *Id*. (quoting Ex. 1006, 7). We agree with Dr. Houh and find that a person of ordinary skill in the art "would have understood that to minimize latency during data transmission, Basturk's 'on-the-fly' teaching means that 'MAC generation

should be carried out as data transmission proceeds,' to reduce latency introduced by MAC computations." *Id.* (quoting Ex. 1006, 7).

We disagree with Patent Owner's contention that a person of ordinary skill in the art would have understood that if a packet requires a signature to be computed, that information will always have to be computed before passing the PDU to the next layer. PO Resp. 25 (citing Ex. 2004 ¶ 108); PO Sur-Reply 17 (Patent Owner contending that computing and inserting a signature at a physical layer defies the principle of generating a PDU at a higher layer and encapsulating at a lower layer.). As discussed in the previous paragraph, Patent Owner's contention is inconsistent with Basturk's disclosure of generating the signature as data transmission proceeds. Further, we agree with Dr. Houh and find that if all functions at one layer had to be completed prior to passing data down to the next layer, the lower layer would not need to work in conjunction with the upper layer and instead could perform independently. Ex. 1033 ¶ 24. We agree with Petitioner and Dr. Houh and find that Basturk's disclosure of off-loading signature computations to dedicated hardware shows, contrary to Patent Owner's contention, that passing data to other components before computing the signature was within the level of ordinary skill. Reply 6–7; Ex. 1033 ¶¶ 25–26; Ex. 1006, 12. We agree with Petitioner and Dr. Houh and find that Basturk teaches signing data at the application level. Reply 15 (citing Ex. 1031, 172:15–16 (Dr. Stubblebine testifying that data is signed at the application level)); Ex. 1033 ¶ 28; Ex. 1006, 3.

We disagree with Patent Owner's contention that Basturk implements its security features only at the transport layer, not at the application layer. PO Resp. 26. Basturk discloses implementing traditional security features

such as integrity at the application level by signing data at the application level. Ex. 1006, 3; Ex. 1033 ¶ 28. Basturk discloses implementing transport level security features such as reliability at the transport level by signing acknowledgement messages which exist only at the transport level. *Id*. at 4–5; Ex. 1033 ¶¶ 32–33. That is, Basturk discloses that its protocol provides transport level integrity by signing transport level data such as acknowledgement messages at the transport level, while still providing application level integrity by signing data at the application level. Ex. 1006, 3–5; Ex. 1033 ¶¶ 28, 32. Contrary to Patent Owner's contention, Basturk's protocol operates at the application layer by signing data at the application layer, in addition to signing acknowledgements at the transport layer. We agree with Petitioner and find that Basturk's secure transport protocols for high-speed networks are focused on secure delivery, including signing data at the application level. Reply 8–11; Ex. 1033 ¶¶ 30–33.

We disagree with Patent Owner's contention that Handley's RTP transport protocol is incompatible with Basturk's increase in reliability to recover from lost data, which is achieved through retransmission policies that cause delay. PO Resp. 25–28. Rather, we agree with Petitioner, that Patent Owner's arguments towards Basturk's disclosure of processing reliability data that only exists at the transport level are unpersuasive, because Patent Owner's arguments are based on bodily incorporation. Reply 8; Ex. 1033 ¶¶ 43–44. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of

ordinary skill in the art. *See In re Keller*, 642 F.2d 413, 425–426 (CCPA 1981). We agree with Petitioner, that Patent Owner misinterprets Ground I of the Petition, which combines Basturk's "on-the-fly" authentication technique with Handley's internet conferencing architecture. Reply 13 (citing Ex. 1033 ¶ 38). We agree with Petitioner that a person of ordinary skill in the art would have understood Basturk's teaching of integrity via signing using the "on-the-fly" technique to mean signing any data using the "on-the-fly" technique in order to achieve the benefit of reducing latency, including signing application layer data that does not require an acknowledgement, such as the application layer data of Handley. *Id*. at 14; Ex. 1033 ¶ 38. We agree with Petitioner and Dr. Houh and find that computing the signature "on-the-fly" as taught by Basturk would not add latency to Handley's transmission because computing the signature occurs in parallel to the transmission. Reply 11–13; Ex. 1033 ¶¶ 34–40.

We disagree with Patent Owner's contention that Handley teaches away from using reliability protocols like Basturk's for transmitting RTP traffic, and that Basturk teaches away from modifying Handley's application layer with Basturk's transport protocol. PO Resp. 28–30. Generally, teaching away requires a reference to actually criticize, discredit, or otherwise discourage investigation into the claimed solution. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) (prior art does not teach away from claimed subject matter merely by disclosing a different solution to a similar problem unless the prior art also criticizes, discredits, or otherwise discourages the solution claimed). Here, Patent Owner contends that Handley and Basturk teach away from each other, not from the claimed solution. Further, Patent Owner's contentions are inconsistent with

Handley's disclosure that authentication and integrity is needed at the RTP packet level and Basturk's disclosure that authentication and integrity is provided at the application level. Ex. 1005, 12–14; Ex. 1006, 3; Ex. 1003 ¶¶ 67–68; Ex. 1033 ¶ 33. We agree with Petitioner and Dr. Houh that Basturk's secure transport protocol is focused on secure delivery and is compatible with Handley for the reasons given by Petitioner and Dr. Houh. Reply 8–14; Ex. 1033 ¶¶ 29–40. We find that neither Handley nor Basturk criticize, discredit, or otherwise discourage providing authentication as an application protocol on an application layer as claimed. To the contrary, we find that Handley teaches the need for providing authentication as an application protocol on an application layer, and Basturk teaches implementing authentication as an application protocol on an application layer. Ex. 1005, 12–14; Ex. 1006, 3–4; Ex. 1003 ¶¶ 67–68; Ex. 1033 ¶¶ 29–40. Therefore, both Handley and Basturk encourage a person of ordinary skill in the art to provide authentication as an application protocol on an application layer as claimed.

We disagree with Patent Owner's contention that Dr. Houh testified that during "on-the-fly" processing, generating and inserting the signature happens at a lower layer. PO Sur-Reply 16–17 (citing Ex. 2010, 66:1–9, 108:10–110:9, 116:18–119:16). To the contrary, Dr. Houh testified that the data "is signed at the application layer." Ex. 2010, 117:12. Dr. Houh's testimony of "sign[ing] things at the application layer . . . and computing [the signatures] on the fly in parallel with transmission, then that is clearly at a lower layer" means that the transmission is at a lower layer, not that computing the signature is at a lower layer. *Id*. at 117:15–19. Dr. Houh's testimony that "Basturk is teaching . . . that you don't have to include these

uncomputed header checksum values or even the MAC signature value . . . . [C]learly Basturk is teaching about the generation of the signature on the fly as the transmission is occurring" means that the data is transmitted while the signature is computed at the application layer, not that the signature is computed at a lower layer. *Id*. at 118:3–7, 119:1–3. Dr. Houh testifies that

> clearly Basturk is teaching the ability to do the generation of a signature on the fly as transmission is occurring. And that occurs at the lower layer in contrast to what Dr. Stubblebine is saying it has required to be computed at the higher layer before being passed down to the lower layer.

Id. at 119:10–16. We find that Dr. Houh's testimony here means that Basturk teaches computing a signature at the application layer and transmitting data at a lower layer. That is, Dr. Houh is testifying that the signature of Basturk does not have to be computed at the application layer before the payload data is passed down to the lower layer and transmitted, contrary to Dr. Stubblebine's testimony. Dr. Houh's testimony is consistent with Basturk's disclosure of computing signatures at the application layer (Ex. 1006, 3) and computing signatures "on-the-fly" as data transmission proceeds (Ex. 1006, 12), and is consistent with Dr. Houh's previous testimony on this issue. Ex. 1003 ¶¶ 82, 84–85; Ex. 1033 ¶¶ 27–28, 34–35, 44.

We disagree with Patent Owner's contention that claim 1 requires "providing authentication 'by inserting . . . authentication data at end of a whole RTP packet payload' specifically 'as an *application* protocol on an *application* layer,' not at the physical or lower layer." PO Sur-Reply 17. First, Patent Owner's new proposed construction of limitation [1.2], presented for the first time in Patent Owner's Sur-Reply, is untimely, and we

decline to consider the untimely construction. "[A] reply . . . that raises a new issue or belatedly presents evidence may not be considered." Patent Trial and Appeal Board Consolidated Trial Practice Guide 74 (Nov. 2019). "Once the Board identifies new issues presented for the first time in reply," the Board "will not attempt to sort proper from improper portions of the reply." *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016). The Federal Circuit held that "where a patent owner in an IPR first proposes a claim construction in a patent owner response, a petitioner must be given the opportunity in its reply to argue and present evidence of anticipation or obviousness under the new construction." *Axonics, Inc. v. Medtronic, Inc.*, 75 F.4th 1374, 1384 (Fed. Cir. 2023). Petitioner does not have that opportunity, because Patent Owner first proposed this construction in Patent Owner's Sur-Reply.

Second, even were we to consider Patent Owner's untimely construction of limitation [1.2], we disagree with Patent Owner. Claim 1 recites "providing transmitter-to-receiver authentication at a Real Time Transport Protocol (RTP) packet level as an application protocol on an application layer by inserting, at the transmitter, authentication data at end of a whole RTP packet payload." Patent Owner's proposed construction removes "at the transmitter" from the claim term "inserting, at the transmitter, authentication data" and replaces it with "inserting, at the application layer, authentication data." We find that the plain meaning of "inserting, at the transmitter, authentication data" encompasses inserting authentication data at the transmitter, and does not limit inserting to occur at the application layer. Patent Owner agrees that the combination of Handley and Basturk discloses this claim term under the correct construction. *See* PO

Sur-Reply 17. Further, even under Patent Owner's untimely and incorrect construction of limitation [1.2], we agree with Petitioner and Dr. Houh that the combination of Handley and Basturk teaches the application layer computing and inserting authentication data at the end of the whole RTP packet payload as an application protocol on an application layer as discussed below in our analysis of "inserting, at the transmitter, authentication data." *See* Ex. 1003 ¶¶ 75–78, 80–85.

We disagree with Patent Owner's contentions that Basturk is incompatible with Handley because, according to Patent Owner, Basturk teaches adding security to the transport layer, not the application layer. PO Sur-Reply 18–19. As discussed above, Basturk teaches adding security to both the application layer and the transport layer. Ex. 1006, 3–5. We disagree with Patent Owner's contention that because Handley does not disclose computing signatures for authentication, a person of ordinary skill in the art would not have used Basturk's "on-the-fly" method to compute signatures in Handley's architecture. *Id*. at 19. First, Handley teaches the need to compute signatures at high packet rates seen with video, and Basturk teaches a method to do so. Ex. 1005, 13–14; Ex. 1006, 5–7, 12. Second, one cannot show non-obviousness by attacking references individually, where the rejections are based on combinations of references. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Handley teaches providing transmitter-to-receiver security at a Real Time Transport Protocol (RTP) packet level as an application protocol on an application layer, but does not teach that the security is authentication data. Ex. 1003 ¶¶ 75–78. Basturk teaches inserting, at the transmitter, authentication security data at the end of a whole RTP packet payload. Ex. 1003 ¶¶ 80–85. The

combination of Handley and Basturk teaches the claimed "providing authentication."

Conclusion for Reasons to Combine

We agree with Petitioner that Basturk teaches generating signatures "on-the-fly" as transmission proceeds in order to avoid slowing down the regular flow of data. Pet. 11 (quoting Ex. 1006, 12). We agree with Petitioner that Handley's RTP protocol used for video conferences would benefit from Basturk's protocol for high speed networks in order to provide secure video conferences as taught by Basturk. *Id.* (citing Ex. 1006, 5; Ex. 1003 ¶ 66). We agree with Petitioner that a person of ordinary skill in the art would have used Basturk's technique of computing signatures "on-the-fly" with Handley's internet conferencing architecture to provide the known benefits of transmitting data faster, reducing jitter, and reducing computing power. *Id.* at 10 (citing Ex. 1003 ¶ 64).

We agree with Petitioner that Handley describes the need for providing authentication in a multicast environment, and that Basturk addresses this need as well as provides a solution. *Id.* at 12–13 (citing Ex. 1005, 13; Ex. 1006, 3; Ex. 1003 ¶ 68). We agree with Petitioner that modifying Handley's RTP transport protocol to include Basturk's known authentication method of generating signatures "on-the-fly" while transmitting data is "the mere application of a known technique to a piece of prior art ready for improvement." *Id.* at 13 (citing Ex. 1003 ¶ 70); *KSR*, 550 U.S. at 417.

In addition, we find that Dr. Houh's testimony supports Petitioner's reasons to combine Handley and Basturk. As discussed above, we find Dr. Houh's testimony more persuasive than Dr. Stubblebine's testimony

because Dr. Houh's testimony is supported by and consistent with the disclosures of Basturk and Handley. Dr. Houh testifies that generating a signature "on-the-fly" as data is being transmitted provides the benefits of transmitting data faster, reducing jitter, reducing computing power, and reducing latency in a live transmission. Ex. 1003 ¶ 64. We agree with Dr. Houh and find that a person of ordinary skill in the art, faced with the need to provide a signature at the application layer in Handley's multimedia conferencing architecture as taught by Handley (Ex. 1005, 2, 13) while minimizing latency as taught by both Handley (Ex. 1005, 13–14) and Basturk (Ex. 1006, 7, 12), would have computed the signature "on-the-fly" as taught by Basturk (Ex. 1006, 7, 12) at the application layer of Handley to yield the benefits of authenticating data while minimizing latency as taught by Basturk. Ex. 1003 ¶¶ 63–70.

Dr. Houh testifies that a person of ordinary skill in the art, in order to allow the transmitter to minimize latency by transmitting data "on-the-fly" while simultaneously computing the signature, would have placed the signature at the end of Handley's RTP packet payload. Ex. 1003 ¶ 85 (citing Ex. 1006, 7; Ex. 1014, 43, 46, 41, 23–24, 26, 27, Fig. 3-1); Ex. 1033 ¶ 16 (citing Ex. 1006, 16 (Basturk disclosing that "[f]ollowing data, a trailer has been added that contains the packet signature.")). Dr. Houh testifies that computing the signature "on-the-fly" while the packet payload data is being transmitted, and inserting the computed signature at the end of the packet, would not add latency to Handley's internet conferencing architecture and would meet Handley's delay bounds. Ex. 1033 ¶¶ 34–35. We agree with Dr. Houh and find that a person of ordinary skill in the art, in order to achieve the benefit of minimizing latency by computing the signature "on-

the-fly," would have placed the signature at the end of Handley's RTP packet.

Accordingly, considering the full record before us, we find that Petitioner has shown that a person of ordinary skill in the art would have had reasons to combine the teachings of Handley and Basturk and would have had a reasonable expectation of success in doing so.

4. Independent Claim 1

Preamble

The preamble of claim 1 recites a "method for transmitting data from a transmitter to a receiver." Petitioner contends that Handley teaches the preamble in disclosing that data is transmitted by senders to receivers in packets over the Internet. Pet. 14 (citing Ex. 1005, 2, 4). Patent Owner does not contend otherwise.

We find that Petitioner has shown that Handley teaches the features recited in the preamble.[7]

[1.1] "Providing transmitter-to-receiver authentication"

Claim 1 recites [1.1] "providing transmitter-to-receiver authentication at a Real Time Transport Protocol (RTP) packet level as an application protocol on an application layer." Petitioner contends that Handley teaches this limitation in disclosing RTP packets that include security measures to control who is listening and to authenticate contributions as actually originating from a specific person. Pet. 15–17 (citing Ex. 1005, 2, 8, 12). Petitioner further contends that Basturk teaches providing the application

[7] Because Petitioner has shown that the features in the preamble are satisfied by the prior art, we need not determine whether the preamble is limiting at this time. *See Vivid Techs.*, 200 F.3d at 803.

level security feature of authentication by signing data at the application level. Pet. 18–19 (citing Ex. 1006, 3).

Contentions for Providing Authentication

Patent Owner contends that while the RTP specification includes provisions for packet encryption, RTP states that authentication and message integrity are not defined in the RTP specification. PO Resp. 31 (citing Ex. 1008, 50). Patent Owner contends that a person of ordinary skill in the art would not have understood Handley's disclosure of RTP encryption schemes to disclose providing authentication at the RTP packet level. *Id.* (citing Ex. 2004 ¶ 119). Patent Owner contends that Basturk does not disclose RTP and thus does not disclose providing authentication at the RTP packet level. *Id.* at 32 (citing Ex. 2004 ¶ 120).

Petitioner contends that Patent Owner takes Basturk's footnote 3 out of context. Reply 14 (citing Ex. 1033 ¶¶ 41–42). Petitioner contends that footnote 3 states that "asking the application to duplicate these transport functions is usually poor design." *Id.* (quoting Ex. 1006, 4 n.3). Petitioner contends that the combination that Petitioner put forth does not ask the application to duplicate transport functions, because any checksums in other protocol layers used in Handley are not for the purpose of authentication. *Id.* (citing Ex. 1033 ¶ 39).

Petitioner contends that Handley discloses providing the security feature of encryption at the RTP packet level as an application protocol on an application layer. Reply 14–15 (citing Ex. 1033 ¶ 41; Ex. 1005, 12). Petitioner contends that Basturk discloses signing data at the application level. *Id.* at 15 (citing Ex. 1031, 172:15–16). Petitioner contends that the combination set forth in the Petition is the combination of Basturk's "on-the-

fly" authentication technique with Handley's internet conferencing architecture. *Id*. (citing Ex. 1033 ¶ 38).

Analysis

We agree with Petitioner that Patent Owner takes Basturk's footnote 3 out of context, and that the combination Petitioner set forth does not ask the application to duplicate transport functions. Reply 14 (citing PO Resp. 31; Ex. 1006, 4 n3; Ex. 1033 ¶¶ 39, 41–42). Footnote 3 of Basturk discloses than an "implicit assumption is that the application is not performing its own acknowledgements and retransmission, but, more naturally, relying on the transport for these features. Indeed, asking the application to duplicate these transport functions (of performing acknowledgments and retransmissions) is usually poor design." Ex. 1006, 4 n3. This footnote is consistent with the rest of Basturk's disclosure that traditional security features such as integrity are performed at the application level by signing data at the application level, and transport level features are implemented at the transport level by signing acknowledgements and retransmissions, which only exist at the transport level. Ex. 1006, 3–5; Ex. 1033 ¶¶ 28, 32. We find Dr. Houh's testimony more persuasive than Dr. Stubblebine's because Dr. Houh's testimony is consistent with Basturk's disclosure of providing integrity at the application level. We find that, contrary to Patent Owner's contention, Basturk's protocol provides integrity at the application layer by signing data at the application layer. *Id*. We agree with Petitioner and find that Basturk's secure transport protocols for high-speed networks teaches providing integrity by signing data at the application level, and that signing data at the application level of Handley would not duplicate the transport level

functions of performing acknowledgements and retransmissions. Reply 14; Ex. 1033 ¶¶ 30–33, 39.

We disagree with Patent Owner's contention that Handley does not suggest providing security at the RTP packet level. PO Resp. 31. We agree with Petitioner and find that Handley discloses providing the security feature of encryption at the RTP packet level, and teaches the need for providing the security feature of authentication at the RTP packet level. Reply 14–15 (citing Ex. 1005, 12; Ex. 1033 ¶ 41); Ex. 1005, 2, 12–14; Ex. 1003 ¶¶ 67–68, 75–78, 80–85; Ex. 1033 ¶ 33. We disagree with Patent Owner's contention that, because the RTP specification does not define authentication and message integrity and expects that authentication and integrity services will be provided by lower layer protocols, a person of ordinary skill in the art would not have recognized a need for authentication and integrity at the RTP packet level. This contention is inconsistent with Handley's disclosure that authentication and integrity is needed at the RTP packet level and Basturk's disclosure that authentication and integrity is provided at the application level. PO Resp. 31, 33 (citing Ex. 1008, 50); Ex. 1005, 12–14; Ex. 1006, 3; Ex. 1003 ¶¶ 67–68; Ex. 1033 ¶ 33.

Patent Owner contends that Basturk does not disclose RTP. PO Resp. 32–33. However, Patent Owner's contention does not address the Petition's combination that Handley discloses RTP, which is an application level protocol, and that Basturk discloses authenticating data at the application level. *See* Pet. 15–19; Reply 15; Ex. 1033 ¶ 38. We agree with Petitioner that the combination of Handley and Basturk teaches providing authentication at Handley's application level protocol by signing data at the application level as taught by Basturk.

Patent Owner contends that Basturk does not disclose that providing transmitter-to-receiver authentication at an RTP packet level would have been easily or usually done. PO Resp. 32. However, Dr. Houh provides persuasive testimony that performing transmitter-to-receiver authentication at the RTP packet level using Basturk's technique of generating signatures "on-the-fly" was within the level of ordinary skill in the art. Ex. 1033 ¶¶ 34–35, 38, 44.

Patent Owner contends that Basturk's transport level integrity feature does not provide authentication as an application protocol on an application level. PO Resp. 33–34. According to Patent Owner, once Basturk's application passes a key to the transport level, the task of applying security is left to the transport machine at the transport layer. *Id*. (citing Ex. 1006, 4, 8). Patent Owner's contention is inconsistent with Basturk's disclosure that traditional security features such as integrity are mostly application level, while Basturk's new security features are transport level, and that Basturk provides, along with the new transport level security features, the standard application level security features. Ex. 1006, 3, 5. Patent Owner's contention is also inconsistent with Dr. Stubblebine's testimony and Dr. Houh's testimony that data is signed at the application level. Ex. 1031, 172:15–16; Ex. 1033 ¶ 28 (Dr. Houh testifies that "Basturk is clear that authentication occurs at the application layer."); Reply 15.

Further, even were we to accept Patent Owner's premise that Basturk discloses performing its "on-the-fly" authentication technique only at the transport level, Patent Owner's contention does not address Petitioner's combination of applying Basturk's "on-the-fly" authentication technique to authenticate Handley's RTP packet data on the application level. Dr. Houh

persuasively testifies that Basturk's disclosure of integrity via signing "means any data sent is signed under the integrity option. This can include any data sent, even data that does not require an acknowledgement," such as Handley's RTP data on the application level. Ex. 1033 ¶¶ 38–39. Basturk's "on-the-fly" "technique has been used to improve [Basturk's protocol to authenticate data while minimizing delay], and a person of ordinary skill in the art would recognize that it would improve [Handley's] device[] in the same way," namely, to authenticate data while minimizing delay. *KSR*, 550 U.S. at 417. The combination of Basturk's security measure of "on-the-fly" authentication with Handley's security measures performed at the RTP packet level on an application layer (Ex. 1005, 2, 11–14) is the "combination of familiar elements according to known methods" that "does no more than yield [the] predictable results" of authenticating data at the RTP packet level on an application layer while minimizing delay. *Id*. at 416.

We find that Petitioner has shown that the combination of Handley and Basturk teaches claim limitation [1.1].

[1.2] "Inserting, at the Transmitter, Authentication Data"

Claim 1 recites at [1.2] "by inserting, at the transmitter, authentication data at end of a whole RTP packet payload." Petitioner contends that Basturk teaches inserting authentication information at the end of a whole packet payload in disclosing that "[f]ollowing data, a trailer has been added that contains the packet signature." Pet. 20 (citing Ex. 1006, 16). Petitioner contends that a person of ordinary skill in the art would have added Handley's authentication data to the end of Handley's RTP packet as taught by Basturk to yield the benefit of allowing the transmitter to transmit data

while simultaneously computing the authentication data as taught by Basturk. *Id.* (citing Ex. 1005, 12; Ex. 1006, 12; Ex. 1003 ¶ 85).

Contentions for "Inserting, at the Transmitter, Authentication Data"

Patent Owner contends that Basturk teaches that "on-the-fly" processing is enabled by locating information for signature verification early in the packet, not at the end of the packet in a trailer. PO Resp. 35 (citing Ex. 2004 ¶¶ 87, 119; Ex. 1006, 12. Patent Owner contends that placing the signature in a trailer prevents computing the signature to start before context is retrieved. *Id*. at 35–36 (citing Ex. 2004 ¶¶ 88–89).

Patent Owner contends that because data is passed between layers of a protocol stack in a PDU only after completely forming the PDU, including generating the signature, the transmitter would not transmit data while simultaneously computing the signature. PO Resp. 36 (citing Ex. 2004 ¶ 108). According to Patent Owner, transmission at the physical layer does not happen before the processing at higher layers is complete, thus, "on-the-fly" processing of the signature and placing the signature in a trailer at a higher layer would not allow computing the signature to be done in parallel with transmitting the packet. *Id*. at 36–37. Patent Owner contends that Dr. Houh's testimony that the Ethernet standard includes a Frame Check Sequence (FCS) at the end of a frame so that the FCS can be computed during transmission and appended to the end of the frame is incorrect. *Id*. at 37–38 (citing Ex. 2004 ¶¶ 128–129).

Patent Owner contends that a person of ordinary skill would have understood that RTP looks for information in the header to check for validity issues, including to verify that the incoming packets have been correctly decrypted. *Id*. at 38 (citing Ex. 2004 ¶ 134). According to Patent Owner,

RTP provides a method for extending the RTP header, not the trailer, to support additional information, which is less expensive to process because it is not conditional nor in a variable condition. *Id*. (citing Ex. 1008, 14–15; Ex. 2004 ¶ 134).

Petitioner contends that Patent Owner misunderstands Basturk's "on-the-fly" teaching. Reply 16. Petitioner contends that the signature can only be computed "on-the-fly" over the data payload and transport header as data transmission proceeds and the signature is placed at the end of the packet. *Id*. (citing Ex. 1033 ¶¶ 11–21, 45–49). Petitioner contends that placing the signature at the beginning or middle of the packet would not allow the signature to be computed during data transmission. *Id*. Petitioner contends that Basturk describes placing the signature at the end of the packet. *Id*. at 17 (citing Ex. 1006, 16; Ex. 1033 ¶ 16).

Petitioner contends that Patent Owner's contention that data is passed between layers only after completely forming the PDU is not supported by the '682 patent nor by Dr. Stubblebine's testimony, for the reasons given in Petitioner's Reply regarding reasons to combine. Reply 17 (citing Reply § V.A.1.b). Petitioner contends that Patent Owner's contention that the RTP RFC provides a method for extending the header rather than providing a trailer ignores the disclosure that "this header extension is intended only for limited use. Most potential uses of this mechanism would be better done another way." *Id*. (quoting Ex. 1008, 15; Ex. 1033 ¶ 50). Petitioner contends that even if the header had a place for the signature, a person of ordinary skill in the art would have still placed the signature at the end of the packet, not in the header. *Id*. at 17–18 (citing Ex. 1033 ¶ 51).

Patent Owner contends that "[u]nder Petitioner's theory, Basturk's 'on-the-fly' processing cannot practice elements [1.1] and [1.2]" because "[t]hese elements require providing authentication 'by inserting . . . authentication data at the end of a whole RTP packet payload' specifically 'as an application protocol on an application layer,' not at the physical layer." PO Sur-Reply 19–20. According to Patent Owner, Handley does not disclose using signatures for authentication, and Basturk computes and inserts the signature at the physical layer, not the application layer. *Id*. at 20. Patent Owner contends that although Handley discloses inserting encryption data at the application layer, encryption data is not authentication data. *Id*. at 20–21 (citing Ex. 2004 ¶ 57). Patent Owner contends that Basturk discloses computing the signature at the transport level based on a key not seen at the application layer. *Id*. (citing Ex. 2010, 34:19–35:14, 68:18–69:16, 75:5–21, 120:5–122:17). Patent Owner contends that although Dr. Stubblebine testified that Basturk signs packets at the application layer, the signing was not part of the transport protocol nor the "on-the-fly" processing. *Id*. (citing Ex. 1031, 170:18–174:19; Ex. 2004 ¶¶ 76–77, 78–83).

Patent Owner contends that Dr. Houh agrees that PDUs in a protocol stack are passed down and encapsulated from one layer to the next. PO Sur-Reply 21 (citing Ex. 2010, 153:3–154:2, 161:22–164:9). Patent Owner contends that Petitioner's theory of using a hardware accelerator for inserting data into a packet at a lower layer in the protocol stack does not teach inserting authentication data as an application protocol on an application layer. *Id*. (citing Ex. 2010, 67:3–13, 116:18–119:16).

Analysis

We disagree with Patent Owner's contention that "on-the-fly" processing is not enabled by placing the signature at the end of the packet. *See* PO Resp. 34–36. We agree with Petitioner that if the signature were not placed at the end of the packet, the signature would not be computed "on-the-fly," simultaneously with data transmission. Reply 16 (citing Ex. 1033 ¶¶ 11–21, 45–49). We agree with Dr. Houh that a person of ordinary skill in the art would have understood Basturk's disclosure of computing the signature as data transmission proceeds to mean generating the signature in parallel with transmitting data. Ex. 1033 ¶ 12. We agree with Dr. Houh, that a person of ordinary skill in the art would have understood that computing the signature "on-the-fly" as data transmission of the packet proceeds can only be done if the signature is placed at the end of the packet. *Id*. at ¶ 15. We agree with Dr. Houh, that Basturk describes placing the signature at the end of the packet in disclosing that "[f]ollowing data, a trailer has been added that contains the packet signature." *Id*. at ¶ 16 (quoting Ex. 1006, 16).

With respect to the need to retrieve context information identified by Dr. Stubblebine, Basturk discloses starting signature computation before retrieving context information. Ex. 1006, 8, 13. We agree with Dr. Houh, that computations can still be performed before the context information is retrieved. Ex. 1033 ¶ 48. Further, although Basturk discloses that context information can be specified early in the packet, Basturk further discloses inserting the signature in a trailer at the end of the packet. *Id*. at 13, 16. Even accepting Patent Owner's contention that context information should be located in the beginning of the packet, Basturk still places the signature at

the end of the packet. We find Dr. Houh's testimony more persuasive than that of Dr. Stubblebine, because Dr. Houh's testimony is supported by the teachings of Basturk. We rely on the testimony of Dr. Houh in finding that Basturk teaches computing a signature simultaneously with transmitting packet data and inserting the signature at the end of the packet. Ex. 1033 ¶¶ 11–21, 45–49.

We disagree with Patent Owner's contention that because data is passed between layers of a protocol stack in a PDU only after completely forming the PDU, including generating the signature, the transmitter would not transmit data while simultaneously computing the signature. *See* PO Resp. 36–37. As discussed above in our analysis of reasons to combine, Patent Owner's contention is inconsistent with Basturk's disclosure of generating the signature as data transmission proceeds. Further, we agree with Dr. Houh and find that if all functions at one layer had to be completed prior to passing data down to the next layer, the lower layer would not need to work in conjunction with the upper layer and instead could perform independently. Ex. 1033 ¶ 24. We agree with Petitioner and Dr. Houh and find that Basturk's disclosure of off-loading signature computations to dedicated hardware shows, contrary to Patent Owner's contention, that passing data to other components before computing the signature was within the level of ordinary skill. Reply 17 (citing Reply 6–7); Ex. 1033 ¶¶ 25–26; Ex. 1006, 12. We agree with Petitioner and Dr. Houh and find that Basturk teaches computing the signature at the application level while simultaneously transmitting data. *Id.*; Ex. 1033 ¶ 28; Ex. 1006, 3. Similarly, we agree with Dr. Houh that the Ethernet standard inserts a Frame Check Sequence (FCS) at the end of the Ethernet frame so that it can be computed

during transmission and appended to the end of the frame. Ex. 1003 ¶ 85; Ex. 1014, 26 (Fig. 3-1 showing the FCS at the end of the frame).

We disagree with Patent Owner's contention that RTP only looks for information in the header to check for validity issues. PO Resp. 38. We agree with Petitioner and Dr. Houh, that "this header extension is intended only for limited use. Most potential uses of this mechanism would be better done another way." Reply 17 (quoting Ex. 1008, 15); Ex. 1003 ¶ 50. We agree with Petitioner and Dr. Houh that a person of ordinary skill in the art would have placed the signature at the end of the packet, not in the header. Reply 17–18; Ex. 1033 ¶ 51.

In Sur-Reply, Patent Owner again proposes its untimely and incorrect construction of "inserting, at the transmitter, authentication data." PO Sur-Reply 19–20. Because Petitioner has not had an opportunity to respond to Patent Owner's construction, we do not consider it. Further, even were we to consider it, we find it incorrect, because Patent Owner's proposed construction inexplicably removes "at the transmitter" from the claim term "inserting, at the transmitter, authentication data at the end of a whole RTP packet." The plain meaning of this claim term is inserting authentication data at the transmitter, which is the only location required by this claim term.

Further, even under Patent Owner's untimely and incorrect construction, the combination of Handley and Basturk teaches this claim term. We agree with Dr. Houh and find that Handley teaches providing transmitter-to-receiver security at the RTP packet level as an application protocol on an application layer by inserting, at the transmitter, encryption security data. Ex. 1003 ¶¶ 75–78. Handley further discloses a need to include authentication security data in the RTP packet. Ex. 1003 ¶¶ 67–68;

Ex. 1005, 13–14. We agree with Dr. Houh and find that Basturk teaches inserting, at the application layer, authentication security data at the end of a packet. Ex. 1003 ¶¶ 80–85. A person of ordinary skill in the art would have inserted, at the application layer, authentication security data at the end of Handley's packet as taught by Basturk to yield the benefits of authenticating data while minimizing latency as taught by Basturk. Ex. 1003 ¶¶ 63–70. The combination of Handley and Basturk is the "combination of familiar elements according to known methods [which] does no more than yield predictable results." *KSR*, 550 U.S. at 416.

We disagree with Patent Owner's contention that Handley does not disclose inserting authentication data into Handley's packet. *See* PO Sur-Reply 20–21. The combination of Handley and Basturk teaches inserting authentication data into Handley's packet. One cannot show non-obviousness by attacking references individually, where the rejections are based on combinations of references. *Merck*, 800 F.2d at 1097.

We also disagree with Patent Owner's contention that Basturk only computes the signature at the transport level, not at the application level. *Id.* at 21. Patent Owner's contention is inconsistent with Basturk's disclosure of computing the signature at the application level for application level security features, even when signatures for transport level functions such as acknowledgements and retransmissions are computed at the transport level. Ex. 1006, 3–5. Further, Petitioner does not rely on Basturk's disclosure of providing signatures at the transport level. Petitioner relies on Basturk's disclosure of providing signatures at the application level, and Basturk's disclosure of computing signatures "on-the-fly." *See* Reply 15; Ex. 1033 ¶¶ 38, 44.

We disagree with Patent Owner's contention that Petitioner misleadingly quotes Dr. Stubblebine out of context when Dr. Stubblebine testified that Basturk signs packets at the application layer, because, according to Patent Owner, the signing that Dr. Stubblebine was asked about is not part of Basturk's transport layer protocol nor "on-the-fly" processing. PO Sur-Reply 21 (citing Reply 15; Ex. 1031, 170:18–174:19). Even if we agree with Patent Owner's contention that Basturk signs transport level functions at the transport level, we disagree with Patent Owner's contention that Basturk does not sign application level security features at the application level as discussed in the previous paragraph. We find that Petitioner properly relies on Dr. Stubbebine's testimony to support Petitioner's contention that Basturk signs application level security features at the application level. With respect to signing "on-the-fly," we agree with Dr. Houh that Basturk's disclosure of "[i]ntegrity via signing" means any data sent is signed under the integrity option "on-the-fly," including data that does not require an acknowledgment, such as application level data. Ex. 1033 ¶¶ 38, 44.

Patent Owner again contends that Dr. Houh testified that Basturk inserts data into a packet at a lower layer in the protocol stack. PO Sur-Reply 21 (citing Ex. 2010, 67:3–13, 116:18–119:16). We disagree with Patent Owner for the reasons given above in our analysis of reasons to combine. We highlight the following for emphasis. Dr. Houh testified that the data "is signed at the application layer." Ex. 2010, 117:12. Dr. Houh's testimony of "sign[ing] things at the application layer . . . and computing [the signatures] on the fly in parallel with transmission, then that is clearly at

a lower layer" means that the transmission is at a lower layer, not that computing the signature is at a lower layer. *Id.* at 117:15–19.

Finally, we disagree with Patent Owner's contention that inserting information at a lower layer does not satisfy the claim's requirement of inserting authentication data as an application protocol on an application layer. PO Sur-Reply 21. First, Patent Owner's contention is based on an untimely and incorrect construction of "inserting, at the transmitter, authentication data" as discussed above. Second, even under Patent Owner's untimely and incorrect construction, the combination of Handley and Basturk teaches this limitation as discussed above.

We find that Petitioner has shown that the combination of Handley and Basturk teaches claim limitation [1.2].

[1.3] "Ascertaining, by the Receiver"

Claim 1 recites [1.3] "ascertaining, by the receiver, whether the receiver knows the transmitter based on the RTP packet level authentication data." Petitioner contends that Handley teaches this limitation in disclosing that secured broadcasts can be performed by digitally signing each packet, and that the receivers discard any packets that are unsigned. Pet. 22 (citing Ex. 1003, 13). Petitioner further contends that Basturk teaches this limitation in disclosing that the transmitter "attaches to each packet p the value of $\mathrm{MAC}_{\alpha}(\overline{p})$ where $\overline{p}$ is the subset of p which includes the transport header, the full data payload, and the trailer of the packet p" and that "the transport header contains information which identifies the sender so that the identity of the sender is covered by the MAC as well." Pet. 23 (citing Ex. 1006, 12).

Patent Owner, in contending that the combination of Handley and Basturk does not disclose this limitation, relies on arguments presented for limitations [1.1] and [1.2], which we find unpersuasive. *See* PO Resp. 38–39; PO Sur-Reply 22; Reply 18. We find that Petitioner has shown that the combination of Handley and Basturk teaches claim limitation [1.3].

[1.4] "Accepting, by the Receiver"

Claim 1 recites [1.4] "accepting, by the receiver, the whole RTP packet payload, if the receiver knows the transmitter, and otherwise rejecting the whole RTP packet payload." Petitioner contends that Handley teaches this limitation in disclosing that unsigned packets are discarded. Pet. 24–25 (citing Ex. 1005, 13). Petitioner contends that Basturk teaches this limitation in disclosing that "[o]n receiving p, τ the receiver checks that $\tau = MAC\alpha(\bar{p})$ and ***rejects*** the packet unless this is true," where p and τ are the transmitted packet and MAC signature, respectively. Pet. 25 (citing Ex. 1006, 14). Petitioner contends that Basturk discloses that "[i]f the signature checking at reception fails, it means the [] packet is corrupted, and the packet is simply dropped: decryption is avoided." *Id.*

Patent Owner does not contend otherwise. We find that Petitioner has shown that the combination of Handley and Basturk teaches claim limitation [1.4].

We determine that Petitioner has shown by a preponderance of evidence that the combination of Handley and Basturk renders claim 1 obvious.

5. Claims 2–21, 23, and 25–28

Petitioner challenges claims 2–21, 23, and 25–28 as unpatentable over the combination of Handley and Basturk. Pet. 26–41. The record supports

Petitioner's showing. *See id.* Patent Owner does not separately argue against Petitioner's showing with respect to these claims. *See* PO. Resp. 39–40; PO Sur-Reply 22. We determine that Petitioner has shown by a preponderance of evidence that the combination of Handley and Basturk renders claims 2–21, 23, and 25–28 obvious for the reasons given by Petitioner and Dr. Houh.

C. Claims 1–28 As Obvious Over PacketCable and Handley

1. PacketCable – Exhibit 1007

a. Publication Date

Petitioner contends that PacketCable was published on December 1, 1999. Pet. 4–5 (citing Ex. 1003 ¶¶ 59–61). Dr. Houh testifies that PacketCable was published on December 1, 1999. Ex. 1003 ¶ 61. Petitioner contends that PacketCable "includes reliable indicia on its face (*i.e.*, copyright, dated revision history/release, date, and consecutive footer date stamps)." Paper 14, 3. Petitioner contends that a "standard's purpose is to be adopted, thus inferring public accessibility." *Id.*

Contentions about Public Accessibility of PacketCable

Patent Owner contends that the present-day CableLabs website does not show accessibility at the relevant time, i.e., before the '682 patent's effective filing date of January 18, 2000. PO Resp. 41. Patent Owner contends that, even if PacketCable's purpose as a standard is to be adopted, Petitioner has offered no evidence that the ordinarily skilled artisan would know how to find PacketCable. *Id*. at 42.

Petitioner contends that PacketCable includes reliable indicia of publication on its face, including a 1999 copyright date, a December 1, 1999 release date, and consecutive "12/01/99" footer date stamps. Reply 2.

Petitioner contends that PacketCable states that "[t]his PacketCable technical report is a cooperative effort undertaken at the direction of Cable Television Laboratories, Inc. (CableLabs®) for the benefit of the cable industry." *Id.* at 3 (quoting Ex. 1007, 1) (emphasis omitted). Petitioner contends that this statement "infers public accessibility." *Id.* Petitioner contends that the Board found PacketCable's indicia "further corroborate . . . that CableLabs intended to disseminate the document at least to the listed member companies of the project and artisans of ordinary skill in those companies seeking to design and/or sell applicable networks." *Id.* (quoting Dec. 27). Petitioner contends that Dr. Hall-Ellis, who is a librarian with over 50 years of experience, confirmed PacketCable was publicly available no later than December 1, 1999. *Id.* (citing Ex. 1019).

Patent Owner contends that the only evidence that Dr. Hall-Ellis provides for public accessibility is the present-day CableLabs website, which says nothing about PacketCable's availability in 1999. PO Sur-Reply 11. Patent Owner contends that Dr. Hall-Ellis did not find evidence that PacketCable was available on the Internet in 1999, nor that PacketCable was accessible anywhere else. *Id.* Patent Owner contends that the conclusion of Dr. Hall-Ellis is based on the word "release" that appears on page 3 of PacketCable. *Id.* at 12. According to Patent Owner, her conclusion that "release" means that the reference was publicly accessible is speculation. *Id.*

Patent Owner contends that inferring public accessibility from PacketCable's intent to disseminate the report to members of the industry does not show that PacketCable was actually disseminated. *Id.* Patent Owner contends that Petitioner has not explained how a person of ordinary skill in the art would have been able to locate PacketCable before January

18, 2000. *Id*. at 13. Patent Owner contends that the copyright date does not indicate when or how PacketCable was made publicly accessible. *Id*.

Analysis

We disagree with Patent Owner's contention that neither the CableLabs website nor the testimony of Dr. Hall-Ellis shows that PacketCable was publicly accessible in 1999. PO Sur-Reply 11–12; PO Resp. 41. We also disagree with Patent Owner's contention that neither the CableLabs website nor Dr. Hall-Ellis provides evidence of what the word "release" on page 3 of PacketCable means. PO Sur-Reply 11–12

Contrary to Patent Owner's contention, the CableLabs website says that version 1 of PacketCable was published on December 1, 1999, which supports the testimony of Dr. Hall-Ellis and is persuasive evidence that the word "release" on page 3 of PacketCable means published. Ex. 1019 ¶ 19 (Dr. Hall-Ellis testifying that she retrieved PacketCable from the CableLabs website); Ex. 2009, 25:2–10 (Dr. Hall-Ellis testifying that the CableLabs website lists the publication date of PacketCable as December 1, 1999); cablelabs.com/specifications/packetcable-1-0-architecture-framework-technical-report (the CableLabs website listing the publication date of PacketCable as December 1, 1999); Tr. 22:3–6 (Petitioner arguing that the website for CableLabs "shows the most recent version of PacketCable" and "says Version 1 was published on December 1, 1999.").

Patent Owner, in contending that the CableLabs website does not show public accessibility, does not address the publication date of December 1, 1999, listed on the website. We find that the testimony of Dr. Hall-Ellis, the release date of December 1, 1999, on page 3 of PacketCable, and publication date of December 1, 1999, on the CableLabs website show, by a

preponderance of evidence, that PacketCable was published on December 1, 1999. We find that PacketCable was publicly accessible on December 1, 1999 for at least this reason. Given the explicit disclosure of the CableLabs website that the publication date of PacketCable is December 1, 1999, we find that Patent Owner's remaining contentions against the testimony of Dr. Hall-Ellis are moot.

We disagree with Patent Owner's contention that PacketCable's purpose, which is dialog with the cable industry, does not show public accessibility. PO Resp. 40–41; PO Sur-Reply 12. Dr. Houh testifies that CableLabs is a research lab funded by cable industry member companies. Ex. 1003 ¶ 61. Dr. Houh testifies that PacketCable is a technical report that defines specifications for interoperable equipment. *Id.* We find Dr. Houh's testimony is supported by PacketCable's disclosure, which repeatedly states that its intended purpose is dialog with the cable industry. For example, PacketCable discloses that the "PacketCable technical report is a cooperative effort undertaken at the direction of Cable Television Laboratories, Inc. (CableLabs®) for the benefit of the cable industry" (Ex. 1007, 1) and "describes the architecture framework for PacketCable™ networks including all major system components and network interfaces necessary for delivery of PacketCable services" (*id*. at 2). "PacketCable™ is a project conducted by Cable Television Laboratories, Inc. (CableLabs®) and its member companies" and "is aimed at defining interface specifications that can be used to develop interoperable equipment capable of providing packet-based voice, video and other high-speed multimedia services over hybrid fiber coax (HFC) cable systems utilizing the DOCSIS protocol." *Id*. at 9. "The PacketCable architecture is designed to be a robust, complete, end-end

broadband architecture that supports voice, video, and other multimedia services." *Id*. at 10. "The goal of PacketCable is to enable full-featured, robust, wide-scale deployment for global cable IP networks." *Id*. at 54; *see id*. at 55 (recognizing sixteen people from twelve companies that contributed to and reviewed PacketCable as well as eight people from CableLabs).

The Federal Circuit has held that "[w]here, as here, a publication's purpose is dialogue with the intended audience, that purpose indicates public accessibility." *Weber, Inc. v. Povisur Tech., Inc.*, 92 F.4th 1059, 1067–68 (Fed. Cir. 2024) (quoting *Valve*, 8 F.4th at 1374). Here, PacketCable discloses that it is a project conducted by CableLabs and its member companies for the benefit of the cable industry in order to develop interoperable equipment and enable wide-scale deployment for global cable IP networks. Ex. 1007, 1–2, 9–10, 54. "[N]o one can seriously suppose that such a document . . . was intended to be kept secret; its whole purpose was to be spread broadcast as far as possible." *Jockmus v. Leviton*, 28 F.2d 812, 814 (2d Cir. 1928).

PacketCable further discloses that sixteen people from twelve cable companies and eight people from CableLabs received and reviewed the document. *Id*. at 55. Thus, PacketCable went "direct to those whose interests make them likely to observe and remember whatever it may contain that is new and useful." *Jockmus*, 28 F.2d at 813–14. This dissemination further shows that "dialog with the intended audience," here, companies in the cable industry, "was the entire purpose of [PacketCable]." *Suffolk Tech., LLC v. AOL, Inc.*, 752 F.3d 1358, 1365 (Fed. Cir. 2014). We find that the purpose of PacketCable, which is dialog with the cable industry to provide a reference framework for developing interoperable equipment used in global

cable IP networks, indicates public accessibility. The purpose and dissemination are strong evidence that PacketCable was publicly accessible as of December 1, 1999. Therefore, we find that PacketCable was publicly accessible as of December 1, 1999 for at least these reasons.

In addition to public accessibility, [a] "printed publication need not be easily searchable after publication if it was sufficiently disseminated at the time of its publication." *Suffolk Tech.*, 752 F.3d at 1365 (citing *In re Klopfenstein*, 380 F.3d at 1350–51). "Thus, the question becomes whether [PacketCable] was sufficiently disseminated." *Id.* In *Massachusetts Institute of Technology v. AB Fortia*, 774 F.2d 1104, 1109 (Fed.Cir.1985), the Federal Circuit held a paper delivered orally at a conference, where "the document itself was actually disseminated without restriction to at least six persons," was a printed publication. In reaching this holding, the Court relied in part on the holding from *Garrett Corp. v. United States*, 422 F.2d 874, 878 (Ct. Cl. 1970), where the reference in question was distributed without restriction to six commercial companies. *Id.* In *Garrett*, the Court of Claims held that distribution to six commercial companies without restriction on use constitutes publication. *Garrett*, 422 F.2d at 878.

Here, CableLabs disseminated PacketCable to sixteen people from twelve companies in the cable industry, where the twelve companies in the cable industry include Telcordia, 3COM, YAS Corp., Cisco, Motorola, General Instrument, Arris Interactive, Netspeak, 8AT&T, Com21, Broadsoft, and IPUnity. Ex. 1007, 55. Thus, PacketCable was disseminated without restriction to at least sixteen persons from twelve companies in the cable industry as of December 1, 1999. *Id.* PacketCable further states that "[t]his document *is furnished* on an AS-IS basis and neither CableLabs, nor

other participating entity, provides any representation or warranty, express or implied, regarding its accuracy, completeness, or fitness for a particular purpose." *Id.* at 1. Considering the evidence of record, we find that PacketCable was sufficiently disseminated to those of ordinary skill in the art to qualify as a printed publication as of December 1, 1999 for at least this reason. *Id*.

We disagree with Patent Owner's contention that because Dr. Hall-Ellis did not provide evidence showing that PacketCable was available on the Internet or in a library, a person of ordinary skill in the art would not have been able to find PacketCable. PO Sur-Reply 11, 13. We also disagree with Patent Owner's contention that an ordinarily skilled artisan would not have known how to find PacketCable, and that Petitioner has not shown that Packet Cable was publicly accessible. PO Resp. 41–42; PO Sur-Reply 13.

Although not required to show PacketCable is a printed publication given the persuasive evidence of the publication date of PacketCable, the purpose of PacketCable, and the actual dissemination of PacketCable, we find that a person of ordinary skill was capable of accessing PacketCable as of December 1, 1999. PacketCable discloses that "[t]he *intended audience* for this document includes developers of equipment intended to be conformant to PacketCable specifications, and network architects who need to understand the overall PacketCable architecture framework." Ex. 1007, 1 (emphasis added). As indicated above, this shows that its "purpose is dialogue with the intended audience, [and] that purpose indicates public accessibility." *Weber,* 92 F.4th at 1067–68 (quoting *Valve*, 8 F.4th at 1374). CableLabs and the PacketCable project were known to the community interested in the subject matter of PacketCable, as shown by PacketCable's

publication date of December 1, 1999, PacketCable's purpose of being disseminated to the cable industry, and the actual dissemination of PacketCable to sixteen people from twelve companies in the cable industry. *See Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1349 (Fed. Cir. 2016); Ex. 1007, 55. We find that a member of the intended audience was capable of gaining access to PacketCable, even if PacketCable was not available on the Internet nor in a library, by requesting a copy of PacketCable from CableLabs on or after December 1, 1999. *See In re Lister*, 583 F.3d 1307, 1313–14 (Fed. Cir. 2009).

b. Teachings of PacketCable

PacketCable discloses that the "IETF standard RTP (RFC 1899 — Real-Time Transport Protocol) is used to transport all media streams in the PacketCable network[32]. PacketCable utilizes the RTP profile for audio and video streams as defined in RFC 1990[35]." Ex. 1007, 31. Figure 7 is reproduced below.

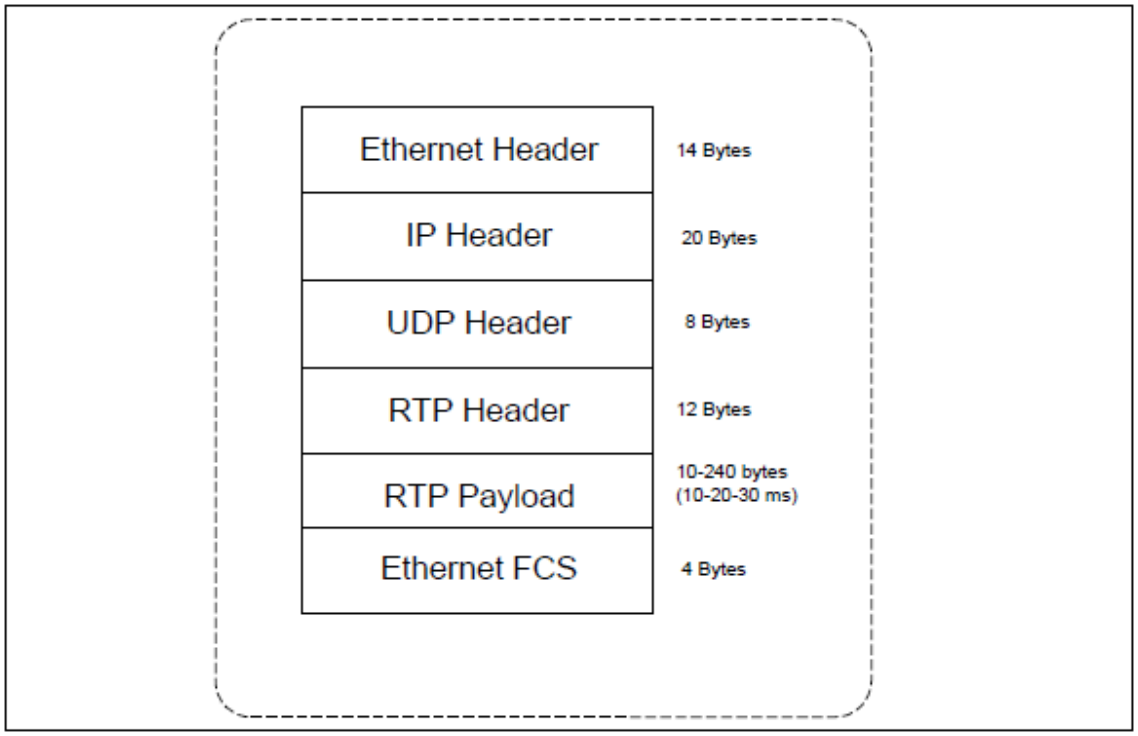

Figure 7. RTP Packet Format

Figure 7 depicts "[t]he packet format for RTP data transmitted over IP over Ethernet." *Id.* at 32.

PacketCable discloses that RTP packets are encrypted without any additional security layers. Ex. 1007, 45. PacketCable discloses that a message authentication code (MAC) provides message integrity. *Id.*; *see id.* at 47.

2. Reasons to Combine the Teachings of PacketCable and Handley

Petitioner contends that a person of ordinary skill would have included Handley's teaching of using signatures to accept or reject packets in an RTP Internet conferencing architecture to provide authentication in PacketCable's high-speed multimedia data architecture to yield the benefit

of improving PacketCable's network security. Pet. 41–43 (citing Ex. 1003 ¶¶ 165–170). Patent Owner does not provide arguments to the contrary.

We find that Petitioner and Dr. Houh show that a person of ordinary skill would have had reason to combine the teachings of PacketCable and Handley for the reasons given in the Petition and by Dr. Houh. Further, as discussed below in our analysis of claim 1, we find that PacketCable alone teaches the limitations of claim 1.

3. Independent Claim 1

Preamble

The preamble of claim 1 recites a "method for transmitting data from a transmitter to a receiver, comprising." Petitioner contends that PacketCable teaches the preamble in disclosing multimedia terminal adapters connected with a pkt-6 interface to send end-to-end media packets between one another. Pet. 44. Patent Owner does not contend otherwise.

We find Petitioner has shown that PacketCable teaches the features recited in the preamble.[8]

[1.1] "Providing transmitter-to-receiver authentication"

Claim 1 recites [1.1] "providing transmitter-to-receiver authentication at a Real Time Transport Protocol (RTP) packet level as an application protocol on an application layer." Petitioner contends that PacketCable discloses RTP, and that RTP is an application protocol whose packets are created at the application layer. Pet. 44–45 (citing Ex. 1007, 45; Ex. 1003 ¶¶ 173–175). Petitioner contends that PacketCable teaches this limitation in

[8] Because Petitioner has shown that the features in the preamble are satisfied by the prior art, we need not determine whether the preamble is limiting at this time. *See Vivid Techs.*, 200 F.3d at 803.

disclosing that "RTP packets are encrypted directly with RC4, without any additional security layers. An MMH-based MAC (Message Authentication Code) optionally provides message integrity. Keys are distributed by the CMS to the two endpoints." Pet. 45 (citing Ex. 1007, 45). Petitioner contends that a person of ordinary skill in the art "would have understood (1) that manipulating RTP packets, e.g., implementing RC4 or adding a MAC, results in authentication at the packet level and (2) RTP packets are created at the application layer because RTP is an application protocol." *Id*. (citing Ex. 1003 ¶ 174).

Contentions for Providing Authentication

Patent Owner contends that Petitioner has not shown that implementing RC4 or adding a MAC is provided as an application protocol on an application layer. PO Resp. 43 (citing Ex. 2004 ¶ 141). Patent Owner contends that MTA (multimedia terminal adapter) devices are responsible for providing secure transport services, including authentication, confidentiality, and integrity of some messages. *Id*. at 43–44 (citing Ex. 2004 ¶ 142). Patent Owner contends that PacketCable does not involve an application in providing secure transport services. *Id*. at 44. According to Patent Owner, PacketCable does not disclose how the optional Message Authentication Code integrity security feature would be included in an RTP packet encrypted directly with RC4. *Id*. Patent Owner contends that authentication and integrity are not defined in the RTP protocol specification. *Id*. Patent Owner contends that a person of ordinary skill in the art would not have understood that PacketCable's disclosure of "implementing RC4 or adding a MAC" would be provided as an application protocol on an application layer. *Id*.

Petitioner contends that PacketCable explicitly discloses that "RTP packets are encrypted directly with RC4, without any additional security layers. An MMH based MAC . . . provides message integrity." Reply 19 (quoting Ex. 1007, 45). Petitioner contends that this disclosure shows that implementing RC4 or adding a MAC as taught by PacketCable results in "providing . . . authentication at [an RTP] packet level as an application protocol on an application layer" as claimed. *Id.* Petitioner contends that even if a device performs authentication, this does not preclude applications on the device from performing authentication. *Id.* at 19–20 (citing Ex. 1033 ¶¶ 57–58).

Patent Owner contends that PacketCable implements RTP as a separate layer from the application layer, rather than as an application protocol on an application layer. PO Sur-Reply 22. Patent Owner contends that PacketCable does not disclose an MTA application performing authentication. *Id.* at 22–23 (citing Ex. 2004 ¶¶ 140–143).

Analysis

We disagree with Patent Owner's contention that the RTP specification's disclosure that "RTP is intended to be malleable to provide the information required by a particular application and will often be integrated into the application processing rather than being implemented as a separate layer" means that RTP could be implemented as a separate layer from the application layer. PO Sur-Reply 22; *see* PO Resp. 42–45; Ex. 2004 ¶¶ 140–143. Dr. Houh testifies that the RTP specification discloses that "RTP represents a new style of protocol following the principles of application level framing and integrated layer processing." Ex. 1003 ¶ 52 (quoting Ex. 1008, 4). The RTP specification goes on to say "[t]hat is, RTP

is intended to be malleable. . . ." Ex. 1008, 4. Dr. Houh testifies that a person of ordinary skill in the art would have understood this disclosure "to mean RTP packets are created at the application layer and use an application protocol because RTP is integrated into the application processing, and the media application generating the audio or video stream is creating the RTP packets as different applications require different packet sizes and different generation rates." Ex. 1003 ¶ 76.

Figure 4 of PacketCable shows the physical layer DOCSIS, then layer 2 DOCSIS 1.1, then layer 3 IP, followed by layer 4 UDP, and above layer 4 is RTP. Ex. 1007, 20 (Fig. 4). PacketCable discloses the "IETF standard RTP (RFC 1899 - Real-Time Transport Protocol) is used to transport all media streams in the PacketCable network[32]. PacketCable utilizes the RTP profile for audio and video streams as defined in RFC 1990[35]." Ex. 1007, 31. Given the conflicting testimony between Dr. Houh and Dr. Stubblebine, we find Dr. Houh's testimony more credible because Dr. Houh's testimony is consistent with the explicit disclosure of PacketCable, which uses RTP in its ordinary fashion as an application protocol on an application layer, which is any layer above layer 4 even under Patent Owner's proposed construction. Therefore, we agree with Dr. Houh and find that PacketCable teaches that RTP is an application protocol on an application layer.

We also disagree with Patent Owner's contention that although "PacketCable relies on RTP (RFC 1889) 'to transport all media streams,' . . . authentication and integrity are expressly 'not defined' in the RTP protocol specification RFC 1889." PO Resp. 44 (quoting Ex. 1008, 50; Ex. 2004 ¶ 142). However, Patent Owner does not quote the full sentence of the RTP

specification, which discloses that "[a]uthentication and message integrity are not defined in the current specification of RTP since these services would not be directly feasible without a key management infrastructure." Ex. 1008, 50. Figure 13 of PacketCable shows "pkt-s6: RTP (RC4+MMH/CMS-based KM)," where "RTP" shows that this is at the application level because RTP is an application protocol, "RC4+MMH" is encryption plus an MMH-based MAC, and "CMS-based KM" provides key management (KM). *See* Ex. 1007, 44 (Fig. 13), 45 ("RTP packets are encrypted directly with RC4. . . . An MMH-based MAC (Message Authentication Code) optionally provides message integrity. Keys are distributed by the CMS to the two endpoints."). Contrary to Dr. Stubblebine's testimony (Ex. 2004 ¶ 142), the disclosure of PacketCable, which provides authentication at the RTP packet level using CMS-based key management, is consistent with the disclosure of the RTP specification, which suggests using a key management infrastructure in order to provide authentication at the RTP packet level. Therefore, we agree with Dr. Houh and find that PacketCable teaches "providing . . . authentication at [an RTP] packet level as an application protocol on an application layer" as claimed. Ex. 1003 ¶ 174.

We find Petitioner has shown that PacketCable teaches limitation [1.1].

[1.2] "Inserting, at the Transmitter, Authentication Data"

Claim 1 recites [1.2] "by inserting, at the transmitter, authentication data at end of a whole RTP packet payload." Petitioner contends that PacketCable teaches this limitation in disclosing that authentication is added to the whole RTP packet in a pkt-6 interface. Pet. 45–46 (citing Ex. 1007,

Fig. 13, 44, 47). Petitioner contends that a person of ordinary skill would have understood that placing the authentication data in the middle of the packet payload would cause packet fragmentation issues as well as other problems. Pet. 46 (citing Ex. 1003 ¶ 178). Petitioner contends that a person of ordinary skill would have understood that the authentication data placement options are either at the beginning or the end of the payload. *Id.* Petitioner contends that a person of ordinary skill would have recognized that the benefits of placing the authentication data at the end of the payload include increasing transmission speeds and decreasing memory usage needed to encrypt and decrypt the data. *Id.* at 46–47.

Contentions for "Inserting, at the Transmitter, Authentication Data"

Patent Owner contends that PacketCable is completely silent as to where in an RTP packet the MAC would be inserted. PO Resp. 46 (citing Ex. 2004 ¶ 146). Patent Owner contends that the RTP protocol specification states that authentication and integrity services are expected to be provided by lower layer protocols in the future. *Id*. at 46–47 (citing Ex. 2004 ¶ 148).

Patent Owner contends that Petitioner identifies no negative performance resulting from placing the MAC in the middle of a packet payload or in the middle of a packet header. PO Resp. 47 (citing Ex. 2004 ¶ 150). Patent Owner contends that RTP provides a header extension mechanism to allow additional data to be placed in the header, and that it is more efficient to find the data in the header than in the payload area. *Id*. at 47–48.

Patent Owner contends that Petitioner does not identify packet fragmentation issues that are avoided by putting the MAC at the end of the packet. PO Resp. 48 (citing Ex. 2004 ¶ 151). According to Patent Owner,

data can be found more quickly in the header, RTP provides a mechanism for placing additional information in the header, and RTP looks for information in the header to check for validity issues. *Id*. at 48–49 (citing Ex. 2004 ¶ 152). Patent Owner contends that the *KSR*-based finite solutions rationale of putting data at the beginning or the end of a payload is inapt because RTP does not define a trailer and defines a mechanism for placing additional information in the header. *Id*. at 49 (Ex. 2004 ¶ 154). Patent Owner contends that RTP can rely on the underlying UDP protocol for providing checksum services, and looks for information in the header to check for validity issues. *Id*. (citing Ex. 2004 ¶ 155).

Patent Owner contends that placing the authentication data at the end of the packet would not reduce latency because all PDU components of the packet need to be stored in temporary memory as the PDU is prepared for passing to the next layer. PO Resp. 49–51 (citing Ex. 2004 ¶¶ 156–159). Patent Owner contends that PDUs are created at higher layers and passed to lower layers for encapsulation. *Id*. at 51–52 (citing Ex. 2004 ¶¶ 160–161).

Petitioner contends that a person of ordinary skill in the art would have had a finite number of places to insert the MAC, the beginning, middle, or end. Reply 20 (citing Ex. 1033 ¶¶ 60–75). Petitioner contends that the RTP specification states that the header extension is of limited use and most uses, such as carrying video encoding information, would be better done another way. *Id*. at 20–21 (citing Ex. 1008, 14–15; Ex. 1033 ¶¶ 67–68). Petitioner contends that placing the MAC in the RTP header extension cannot be done when an RTP header extension already exists. *Id*. at 21 (citing Ex. 1033 ¶ 68).

Petitioner contends that placing the MAC in the middle of the packet would interrupt the data in the packet and extra fields would be required to identify the location of the authentication data within the packet. Reply 21 (citing Ex. 1033 ¶ 61). Petitioner contends that inserting authentication data in the middle of the packet causes the data to be separated into two data segments. *Id.* (citing Ex. 1033 ¶ 62). Petitioner contends that inserting the authentication data at the end of the payload avoids separating the data and avoids the need for additional data fields, and allows the transmitter to transmit data while simultaneously computing the signature, which prevents transmission delay. *Id.* at 21–22.

Petitioner contends that although UDP provides checksum services which can be used to verify there are no errors in the received data, the checksum is not used for authentication. Reply 22 (citing Ex. 1033 ¶ 71). Petitioner contends that UDP's checksum services have no bearing on PacketCable's explicit statement that a MAC can be used in conjunction with RTP packets. *Id.* (citing Ex. 1007, 45; Ex. 1033 ¶ 71).

Petitioner contends that inserting the MAC at the end of the packet allows the transmitter to transmit data in parallel with computing the signature, thus preventing unnecessary delays due to first computing the signature then transmitting the payload. *Id.* (citing Ex. 1033 ¶ 62). Petitioner contends that Patent Owner mistakenly contends that placing the signature at the end of the RTP packet payload results in bit-by-bit processing. *Id.* at 22–23. Petitioner contends that the benefits of inserting the packet at the end include reducing the latency to transmit the packet. *Id.* at 23 (citing Ex. 1033 ¶ 74).

Patent Owner, in Sur-Reply, repeats its contention that PacketCable is silent as to where the MAC would be located, that RTP does not define a trailer, and that RTP provides space in a header where it would be possible to place the MAC. PO Sur-Reply 23. Patent Owner contends that separating data into segments within a packet by placing a MAC in the middle of the packet is not data fragmentation, it is data separation. *Id.* at 23–24. Patent Owner contends that because the RTP payload has a variable length, placing the MAC at the end of the payload requires additional resources to find. *Id.* at 24 (citing Ex. 2004 ¶¶ 41–42, 150, 152). Patent Owner contends that placing the MAC at the end of the packet would not reduce latency for the reasons given in Patent Owner's analysis of Ground 1. *Id.*

Analysis

Petitioner and Patent Owner rely extensively on their corresponding experts to support their contentions. Therefore, we analyze the contentions in light of the testimony of the experts, and determine which testimony we find more credible.

Dr. Houh identifies three possible locations to place the authentication data, at the beginning of the payload, in the middle of the payload, and at the end of the payload. Ex. 1003 ¶ 178. Dr. Houh testifies that placing the authentication data at the beginning of the payload requires storing the packet, computing the authentication data, and transmitting the packet. *Id.* Dr. Houh testifies that placing the authentication data at the end of the packet, in contrast, allows the transmitter to calculate the authentication data while transmitting the packet data, which increases transmission speeds and decreases memory usage. *Id.* Dr. Stubblebine testifies that RTP provides a

header extension for additional data, and that a person of ordinary skill in the art would have placed the authentication data in the header extension. Ex. 2004 ¶ 152. Dr. Houh testifies that the RTP specification discloses that the header extension is for limited use, and that most uses of the header extension would be better done another way. Ex. 1033 ¶ 67 (citing Ex. 1008, 15). Dr. Houh testifies that the RTP specification also discloses that additional information required for a payload format, such as a video encoding, should be carried in the payload section of the packet. *Id*. (citing Ex. 1008, 14). Dr. Houh testifies that there can be only one header extension in an RTP packet header, so this technique cannot be used where an RTP header extension already exists. *Id*. (citing Ex. 1008, 15). Dr. Houh testifies that using the RTP header introduces an additional variable length field which results in additional processing. *Id*. Dr. Houh testifies that adding the MAC to the end of the packet would not use any more resources because the packet is already variable length. *Id*. ¶ 69.

We find Dr. Houh more credible because his testimony is consistent with the RFP specification's disclosure that the header extension is for limited use, that most uses of the header extension are better done another way, that additional information required for a payload format should be carried in the payload section of the packet, and that the header extension cannot be used where an RTP header extension already exists. Ex. 1008, 14–15. We find that a person of ordinary skill in the art would not have inserted the authentication data at the beginning of the packet for the reasons given by Dr. Houh. Ex. 1003 ¶ 178; Ex. 1033 ¶¶ 67–69.

Dr. Houh testifies that when authentication data is placed in the middle of the packet, the payload data would be interrupted, and extra data

fields would be needed to identify the location of the authentication data within the payload data. Ex. 1003 ¶ 178. Dr. Houh testifies that a person of ordinary skill would not place authentication data in the middle of the payload data in order to avoid interrupting the data in the packet and to avoid the need for extra data fields. *Id.* Dr. Stubblebine testifies that Dr. Houh does not identify any negative impacts to performance that result from placing the authentication data in the middle of a packet payload or in the middle of a packet header. Ex. 2004 ¶¶ 150–151.

However, Dr. Stubblebine does not address Dr. Houh's testimony that "the data in the packet would be interrupted by authentication data, and extra data fields would be needed to identify the exact location of the authentication data within the packet data." Ex. 1003 ¶ 178; Ex. 1033 ¶¶ 61–65. We find Dr. Houh's unrebutted testimony more credible. We find that a person of ordinary skill in the art would not have inserted the authentication data in the middle of data for the reasons given by Dr. Houh. Ex. 1003 ¶ 178; Ex. 1033 ¶¶ 61–66.

Dr. Houh further testifies that placing the authentication data at the end of the payload data would reduce latency because this allows the packet to be transmitted while the authentication data is calculated. Ex. 1003 ¶ 178. To support this testimony, Dr. Houh testifies that the Ethernet standard inserts a Frame Check Sequence (FCS) at the end of an Ethernet frame so that the FCS can be computed during transmission and appended to the end of the frame. *Id.* (citing Ex. 1014, 23–24, 26–27, 41, 43, 46, Fig. 3-1). Dr. Stubblebine testifies that placing authentication data at the end of the packet would not reduce latency because the PDU needs to be encapsulated

down the protocol stack until it reaches the physical layer, which is where bit-by-bit transmission occurs. Ex. 2004 ¶ 158.

Dr. Stubblebine's reason that a person of ordinary skill in the art would not place the authentication data at the end of the packet of PacketCable is the same reason that Dr. Stubblebine gave in testifying that Basturk's "on-the-fly" processing does not teach placing authentication data at the end of the packet. Ex. 2004 ¶ 108. That is, Dr. Stubblebine testifies that a person of ordinary skill in the art would not have been able to compute the authentication data while simultaneously transmitting packet data, because the authentication data needs to be computed and encapsulated at the application level before the PDU is passed down to the physical layer. *See* Ex. 2004 ¶¶ 108, 158. We find Dr. Houh's testimony, that a person of ordinary skill would have been able to calculate the authentication data while simultaneously transmitting packet data, more credible for the reasons given above in our analysis of Ground 1. *See* Ex. 1033 ¶¶ 11–12, 73–75; Ex. 1003 ¶¶ 64–65, 84–85, 179. We find that a person of ordinary skill in the art would have inserted authentication data at the end of the RTP packet payload for the reasons given by Dr. Houh. Ex. 1033 ¶¶ 11–28, 61–62, 73–75; Ex. 1003 ¶¶ 85, 178.

We disagree with Patent Owner's contention that the *KSR*-based finite solutions rationale of putting data at the beginning or the end of a payload is inapt because, according to Patent Owner, RTP does not define a trailer but instead defines a mechanism for placing additional information in the header. *See* PO Resp. 49. In particular, we disagree that a person of ordinary skill would have placed authentication data in the header as discussed above. Further, Patent Owner's contention that a person of

ordinary skill in the art would not have been able to place authentication data at the end of the RTP packet is inconsistent with the knowledge of a person of ordinary skill in the art. Ex. 1003 ¶ 178; Ex. 1033 ¶ 16; Ex. 1014, 26 (Fig. 3-1); Ex. 1006, 16.

Even if we were to accept Patent Owner's contention that computing the signature and inserting the signature on an application level while simultaneously transmitting data was not within the level of ordinary skill in the art, we still find that computing the signature and inserting the signature at the end of the packet on the application level would have been obvious. Given the finite choices of inserting the signature at the beginning, middle, or end of the packet, we find that a person of ordinary skill in the art would have inserted the signature at the end of the packet in order to avoid having a variable-length header at the beginning of the packet and to avoid separating data in the middle of the packet. *See KSR*, 550 U.S. at 421 ("When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense."); *Uber Techs., Inc. v. X One, Inc.*, 957 F.3d 1334, 1340 (Fed. Cir. 2020) (Reversing the Board's determination of lack of motivation, stating that "because Okubo's terminal-side plotting and Konishi's server-side plotting were both well known in the art, and were the only two identified, predictable solutions for transmitting a map and plotting locations, it would have been obvious to substitute server-side plotting for terminal-side plotting in a combination of Okubo and Konishi.") (citing *KSR*, 550 U.S. at 421).

The Supreme Court has held that "if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill." *KSR*, 550 U.S. at 417. Here, Dr. Houh persuasively testifies that an Ethernet frame places integrity data at the end of the frame, and we agree with Dr. Houh in finding that a person of ordinary skill in the art would have recognized that placing PacketCable's MAC integrity data at the end of the RTP packet would improve PacketCable's device in the same way.

We find that PacketCable teaches limitation [1.2].

[1.3] "Ascertaining, by the Receiver"

Claim 1 recites [1.3] "ascertaining, by the receiver, whether the receiver knows the transmitter based on the RTP packet level authentication data." Petitioner contends that PacketCable teaches this limitation in disclosing that each RTP packet may include a MAC. Pet. 48 (citing Ex. 1007, 47). Petitioner contends that PacketCable discloses that the keys for the encryption and MAC calculation are derived from the end-to-end secret, which is exchanged between sending and receiving MTAs as part of the call signaling. Pet. 49 (citing Ex. 1007, 47). Patent Owner contends that a person of ordinary skill would have understood that a receiver MTA knows the shared secret key, which it then uses with the received message to see if the computed MAC matches the MAC received from the transmitter MTA. Pet. 49–50 (citing Ex. 1003 ¶ 182).

Patent Owner, in contending that PacketCable does not teach this limitation, relies on contentions presented for limitations [1.1] and [1.2] in

Patent Owner's analysis of Ground 2. PO Resp. 53. We disagree with Patent Owner for the reasons given above.

We find that PacketCable teaches limitation [1.3].

[1.4] "Accepting, by the Receiver"

Claim 1 recites [1.4] "accepting, by the receiver, the whole RTP packet payload, if the receiver knows the transmitter, and otherwise rejecting the whole RTP packet payload." Petitioner, relying on the testimony of Dr. Houh, contends that a person of ordinary skill would have understood that if the MAC of PacketCable is not verified and accepted by the receiver, then the receiver would reject the data, meaning that it would not process or decrypt the data. Pet. 50 (citing Ex. 1003 ¶¶ 184–186).

Patent Owner does not contend otherwise. We find that PacketCable teaches this limitation.

Because Petitioner has shown that PacketCable alone teaches all elements of claim 1, Petitioner has shown that the combination of PacketCable and Handley teaches claim 1. Further, we adopt Petitioner's reasoning regarding the combination of PacketCable and Handley for the reasons given in the Petition and by Dr. Houh. We determine that Petitioner shows by a preponderance of evidence that the combination of PacketCable and Handley renders claim 1 obvious for the reasons given by Petitioner and Dr. Houh.

4. Claims 2–21, 23, and 25–28

Petitioner challenges claims 2–28 as unpatentable over the combination of PacketCable and Handley. Pet. 50–64. The record supports Petitioner's showing. *See id.* Patent Owner does not separately argue against Petitioner's showing with respect to these claims. We determine that

Petitioner has shown by a preponderance of evidence that the combination of PacketCable and Handley renders claims 2–21, 23, and 25–28 obvious for the reasons given by Petitioner and Dr. Houh.

5. Claims 22 and 24

Claim 22 depends from claim 21 and recites "the receiver and transmitter are each disposed in at least one of a switching node and a switching installation." Claim 24 depends from claim 23 and recites a similar limitation. Petitioner contends that Figures 5 and 6 of PacketCable disclose using media gateways. Pet. 57 (citing Ex. 1003 ¶¶ 222–224). Petitioner contends that a person of ordinary skill in the art "would have understood the media gateways act to switch data between a particular IP flow and a particular PSTN port on the gateway, and the receiver and transmitter would be disposed in these switches." *Id*. at 58 (citing Ex. 1003 ¶ 224). Petitioner contends that a person of ordinary skill in the art would have included this functionality in a media gateway, which terminates the IP data side into the PSTN and acts as a switch between a particular IP flow and a particular PSTN port. *Id*. at 58–59. Petitioner contends that a person of ordinary skill in the art would have included the gateway to yield the benefit of having data network devices communicate with all pre-existing telephones on the PSTN such that the data network devices can conduct a telephone call with users beyond those on the data network. *Id*. at 59.

Patent Owner contends that Petitioner has not shown how the media gateway acts as a transmitter and receiver. PO Resp. 54. Patent Owner contends that Petitioner has not explained how switching between an IP flow and a PSTN port includes inserting authentication data at the end of an RTP packet payload or ascertaining whether the receiver knows the transmitter

based on the authentication data. *Id.*; Ex. 2004 ¶ 167. Patent Owner contends that a person of ordinary skill in the art would have understood that IP is at a lower layer than the application layer. *Id.*

Petitioner contends that because the gateway terminates the IP flow, the gateway terminates the RTP streams, and this both generates RTP packets containing data from the PSTN side of the call and receives RTP packets to convert to the PSTN format. Reply 23–24 (citing Ex. 1033 ¶ 79). Petitioner contends that the gateway therefore generates RTP packets with the MAC at the end of the packet when converting call data from the PSTN into IP packets, and authenticates received RTP packets by computing the MAC and comparing it to the MAC received at the end of a packet when converting call data from IP packets into PSTN. *Id.*

Patent Owner contends that Petitioner's contention in the Reply relies on new reasons and opinions. PO Sur-Reply 24–25. Patent Owner contends that we should not consider Petitioner's contention in the Reply. *Id.* at 25.

We disagree with Patent Owner. Dr. Houh explained in his first declaration that a gateway terminates the IP data side into the PSTN and acts as a switch between an IP flow and a PSTN port. Ex. 1003 ¶ 224. Dr. Houh explained in his second declaration that this means that the gateway, in terminating the IP flow, terminates the RTP streams, which generates RTP packets containing data from the PSTN side of the call and receives RTP packets to convert to the PSTN packet. Ex. 1033 ¶ 79.

We rely on Dr. Houh's testimony in finding that a person of ordinary skill in the art, reading Dr. Houh's testimony in paragraph 224 of Exhibit 1003, would have understood that a gateway that terminates the IP data flow does so by generating RTP packets containing data from the PSTN side and

receives RTP packets to convert to the PSTN packet. Ex. 1003 ¶ 224; Ex. 1033 ¶ 79. We find that a person of ordinary skill in the art would have understood that doing so in the context of Figures 5 and 6 of PacketCable results in generating RTP packets with the MAC at the end of the packet when converting call data from the PSTN into IP packets and authenticates received RTP packets by computing the MAC and comparing it to the MAC received at the end of the packet when converting call data from IP packets to PSTN. Ex. 1033 ¶ 79. Dr. Houh's explanation in the second declaration is not a new reason or opinion. Rather, it is an elaboration of his previous testimony in response to apparent confusion or lack of understanding by Patent Owner and Dr. Stubblebine. Further, Patent Owner had the opportunity to respond to Dr. Houh's testimony in the Sur-Reply.

Petitioner has shown by a preponderance of evidence that the combination of Handley and PacketCable renders claims 22 and 24 obvious.

D. Claims 1–28 as Obvious over PacketCable and Basturk

1. Reasons to Combine PacketCable and Basturk

Petitioner contends that a person of ordinary skill in the art would have computed signatures in PacketCable's architecture using Basturk's "on-the-fly" technique for computing signatures to yield the benefits of faster data transmission, reduced jitter, and reduced computing power. Pet. 64 (citing Ex. 1003 ¶¶ 258–263). Petitioner contends that using PacketCable's architectural framework in conjunction with Basturk's secure transport protocol applies a known technique to a known device ready for improvement to yield predictable results. *Id.* at 66 (citing Ex. 1003 ¶ 265).

Patent Owner contends that Basturk teaches away from modifying the application layer with transport level protocol. PO Resp. 55 (citing Ex. 2004

¶ 169). We disagree, because Patent Owner's contention is inconsistent with the explicit disclosure of Basturk as discussed above in our analysis of Ground 1. We emphasize that Basturk does not criticize, discredit, or otherwise discourage providing authentication as an application protocol on an application layer as claimed. To the contrary, we find that Basturk teaches implementing authentication as an application protocol on an application layer. Ex. 1006, 3–4 ("*Integrity* and *confidentiality* are the two traditional, and important, security features. The first means that it isn't possible for *E* to modify the contents of transmitted data. . . . This is the reason we view them as application level security features. . . . Integrity is usually guaranteed by *signing* the data before passing it to the transport level.").

Patent Owner contends that Basturk's transport level reliability features result in end-to-end delay that make Basturk unsuitable for transmitting real-time data carried by RTP. PO Resp. 55–56 (citing Ex. 2004 ¶ 170). We disagree for the reasons given in our analysis of Ground 1. We highlight the following for emphasis. The Petition relies on Basturk's teaching of the application level security feature of data integrity provided by computing a signature, as well as computing the signature "on-the-fly" and inserting the signature at the end of the packet, and PacketCable's teaching of providing authentication at an RTP packet level by inserting, at the transmitter, a signature at the end of the RTP packet. Pet. 64–66. The Petition does not rely on combining Basturk's additional feature of transport level reliability into PacketCable's architecture. Patent Owner's contention does not address Petitioner's combination.

Patent Owner contends that Basturk teaches computing the signature before retrieving context information, but PacketCable requires retrieving context information before computing the signature. PO Resp. 56–58 (citing Ex. 2004 ¶¶ 171–177). Patent Owner contends that Basturk's "on-the-fly" method of computing a signature is incompatible with PacketCable. *Id.*; PO Sur-Reply 25.

Petitioner contends that Dr. Stubblebine testified that Basturk discloses that the key, or "context," is immediately available for both transmitting and receiving. Reply 24–25 (citing Ex. 1031, 146:11–147:7, 148:9–149:13; Ex. 1033 ¶ 83). Petitioner contends that Dr. Stubblebine's admission contradicts Patent Owner's contention that "the delay associated with context retrieval would be unavoidable in PacketCable, meaning that 'on-the-fly' cannot be achieved." *Id.* at 25 (quoting PO Resp. 58).

We agree with Petitioner. Dr. Stubblebine, when addressing Basturk's discussion of latency due to context retrieval, testifies that "there is supposedly an issue of latency for context retrieval. But now there isn't any for transmission. And for the same reasons there isn't any latency for transmission, there is also no latency for reception." Ex. 1031, 148:9–149:13. Dr. Stubblebine testifies that the reason there is no latency for context retrieval is because "both a sender and a receiver have a key in memory. And when the next packet happens, there is no context retrieval. There is – the key is immediately available." *Id.* We rely on the testimony of Dr. Houh in finding that Dr. Stubblebine admits that context is immediately available on both transmission and reception, therefore, there would be no delay due to context retrieval when applying Basturk's "on-the-fly" processing to PacketCable. *See* Ex. 1033 ¶ 83.

We agree with Petitioner and find that a person of ordinary skill in the art would have had a reason to combine the teachings of PacketCable and Basturk for the reasons given in the Petition and by Dr. Houh. Pet. 64–66; Ex. 1003 ¶¶ 258–265. In particular, we agree with Petitioner that a person of ordinary skill in the art would have computed signatures in PacketCable's architecture using Basturk's "on-the-fly" technique for computing signatures to yield the benefits of faster data transmission, reduced jitter, and reduced computing power. Pet. 64 (citing Ex. 1003 ¶¶ 258–263). We agree with Petitioner that using PacketCable's architectural framework in conjunction with Basturk's secure transport protocol applies a known technique to a known device ready for improvement to yield predictable results. *Id*. at 66 (citing Ex. 1003 ¶ 265).

2. Independent Claim 1

Petitioner contends that the limitations of claim 1 are shown by the combination of PacketCable and Basturk for the reasons given in the Petition's analysis of Grounds 1 and 2. Pet. 66–67. Patent Owner disagrees for the reasons given in Patent Owner's analysis of Grounds 1 and 2. PO Resp. 59. We disagree with Patent Owner for the reasons given in our analysis of Grounds 1 and 2.

Because Petitioner has shown that PacketCable alone teaches all elements of claim 1, Petitioner has shown that the combination of PacketCable and Basturk teaches claim 1. Further, we adopt Petitioner's reasoning regarding the combination of PacketCable and Basturk for the reasons given in the Petition and by Dr. Houh. We determine that Petitioner shows by a preponderance of evidence that the combination of PacketCable

and Basturk renders claim 1 obvious for the reasons given by Petitioner and Dr. Houh.

3. Claims 2–28

Petitioner challenges claims 2–28 as unpatentable over the combination of PacketCable and Basturk. Pet. 67–72. The record supports Petitioner's showing. *See id.* Patent Owner does not separately argue against Petitioner's showing with respect to these claims.

We determine that Petitioner has shown by a preponderance of evidence that the combination of PacketCable and Basturk renders claims 2–28 obvious for the reasons given by Petitioner and Dr. Houh.

E. Claims 22 and 24 as Obvious over Handley, Basturk, and PacketCable

Petitioner contends that the combination of Handley, Basturk, and PacketCable teaches the limitations of claims 22 and 24. Pet. 72–73. Petitioner contends that a person of ordinary skill would have added the media gateway of PacketCable to the combination of Handley and Basturk to yield the benefit of having data network devices communicate with pre-existing public switched telephone lines so that the data network devices can conduct a telephone call with users beyond just those on the data network. Pet. 73. Patent Owner disagrees for the reasons given in Patent Owner's analysis of Grounds 1 and 2. PO Resp. 61.

We agree with Petitioner. We find that Ground 1 of the Petition identifies where the combination of Handley and Basturk teaches the limitations of challenged claims 1–21, 23, and 25–28, and Ground 2 of the Petition identifies where PacketCable teaches the limitations of challenged claims 1–28, as discussed above in our analysis of Grounds 1 and 2. The record supports Petitioner's showing. *See* Pet. 72–73. Petitioner provides

persuasive reasons for a person of ordinary skill to combine the teachings of Handley, Basturk, and PacketCable. *Id.* These reasons are supported by the testimony of Dr. Houh. Ex. 1003 ¶ 320. Therefore, we determine that Petitioner shows by a preponderance of evidence that the combination of Handley, Basturk, and PacketCable renders claims 22 and 24 obvious.

VIII. CONCLUSION

In summary, we determine a preponderance of the evidence establishes that claims 1–28 are unpatentable:[9]

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–21, 23, 25–28	103(a)	Zhao	1–21, 23, 25–28	
1–28	103(a)	PacketCable, Handley	1–28	
1–28	103(a)	PacketCable, Basturk	1–28	
22, 24	103(a)	Handley, PacketCable, Basturk	22, 24	
Overall Outcome			1–28	

[9] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

IX. ORDER

In consideration of the foregoing, it is hereby

ORDERED that claims 1–28 of the '682 patent have been proven by a preponderance of evidence to be unpatentable; and

FURTHER ORDERED that, because this is a final written decision, parties to this proceeding seeking judicial review of the Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

McKONE, *Administrative Patent Judge*, dissenting.

I disagree that Petitioner has shown, or even argued properly, that Handley, Ex. 1005, qualifies as a prior art printed publication. I also disagree that Petitioner has shown that PacketCable qualifies as a prior art printed publication. Thus, I would not find that Petitioner has shown, by a preponderance of the evidence, that any claim of the '682 is unpatentable. Accordingly, I dissent.

As to Handley, in the Petition, Petitioner argued that its "challenge is based on the following prior art, for which a detailed overview is provided in the Declaration of Dr. Houh, which is incorporated by reference. EX1003, Section VI." Pet. 4.[10] Petitioner then lists its alleged prior art references and, without supporting evidence, the dates of public accessibility it would ascribe them. *Id.* at 4–5. Dr. Houh, in turn, provided the conclusory testimony that Exhibit 1005 "was published February 11, 1999, in the Computer Networks journal." Ex. 1003 ¶ 59. As I explained in my Dissent to the Institution Decision, this was a statement without a basis, not reflected on the face of Handley and not based on Dr. Houh's personal knowledge or his expertise. Paper 16, 41–42. Rather, he was simply "informed," presumably by Petitioner's attorneys, that Handley qualifies as prior art.

[10] As I pointed out in my dissent to the Institution Decision (Paper 16, 39), our rules state that "[a]rguments must not be incorporated by reference from one document into another document." 37 C.F.R. § 42.5(a)(3). I would find a violation of our rules. If the Majority decided to excuse this violation, or simply waived this rule pursuant to 37 C.F.R. § 42.5(b), they should have explained why and given Patent Owner an opportunity to address their reasoning.

Ex. 1003 ¶ 58.[11] To the extent that Dr. Houh was relying on his expertise, the Majority should have given that testimony no weight. *See* 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight."). If the Majority waived this rule pursuant to 37 C.F.R. § 42.5(b), they did not explain why.

Petitioner's Preliminary Reply also stated that Handley was a "publication in COMPUTER NETWORKS, a publicly disseminated commercial journal by a well-known publisher (Elsevier), on February 11, 1999, corresponding to Volume 31, Issue 3 at pages 191–204." Paper 14, 1. Handley itself does not provide this citation, nor did Dr. Houh in his testimony. Ex. 1005; Ex. 1003 ¶ 59. Petitioner later conceded that Handley was not published in COMPUTER NETWORKS and, instead, alleged that a different document including Handley's content was the document actually published in COMPUTER NETWORKS. Petitioner's Motion to Submit Supplemental Information, Paper 21 ("Motion") 1. For the reasons given in my Dissent to the Institution Decision, I would not find that Petitioner made a sufficient showing in the Petition that Handley was a printed publication and prior art to the '682 patent.

As to Petitioner's Motion to Submit Supplemental Information, unlike the Majority, I would not consider Petitioner's arguments in its Motion to be substantive arguments regarding whether Handley qualifies as a printed publication and would not consider the Majority's Order Granting

[11] Petitioner submitted a Preliminary Reply arguing that Dr. Houh was testifying as to his personal knowledge. His actual testimony does not support this argument. Ex. 1005 ¶ 58.

Petitioner's Motion to Submit Supplemental Information (Paper 28, "Order") to be a proper factual finding or legal conclusion on that issue that would govern the proceeding going forward. The Majority appears to treat the Motion as a substantive presentation of Petitioner's positions supported by record evidence, akin to what Petitioner would put in a Petition. However, Petitioner did not seek a ruling on the substantive merits of Handley's printed publication status; rather, Petitioner "request[ed] permission to submit Exhibits 1016–1028." Motion 9. Petitioner was required to show only that the proposed supplemental information is "relevant to a claim for which the trial has been instituted." 37 C.F.R. § 123(a)(2). To that end, Petitioner introduced Exhibits 1016–1018 and 1020–1028 and asserted that "these exhibits evidence that Handley was publicly accessible on or before February 11, 1999." Motion 4–6. Petitioner did not request factual findings or legal conclusions on this evidence and, indeed, would have had no reason to do so, as all it sought to show was that the supplemental information was "relevant to the instituted obviousness grounds, *i.e.*, to the public accessibility of Handley." *Id.* at 4.

In responding to Petitioner's Motion, Patent Owner pointed out (correctly, in my view) that Petitioner's proposed supplemental information was relevant to a different theory than presented in the Petition, i.e., a theory that Exhibit 1028, not Exhibit 1005 (Handley), was published in the journal COMPUTER NETWORKS. Patent Owner's Opposition to Petitioner's Motion to Submit Supplemental Information, Paper 25 ("Opp.") 6–8. Patent Owner was not in a position to challenge the substance of the supplemental information directly, as Petitioner had not yet been given permission to submit it to the record of the proceeding and there was no opportunity for

Patent Owner to test that evidence or introduce evidence of its own. Nor would Patent Owner be expected to do so, as Petitioner did not ask for factual findings or legal rulings regarding its legal theories or the admissibility or weight to be given to these documents; all Petitioner sought to show was a threshold level of relevance. Patent Owner had no reasonable expectation that the Order would be treated akin to a summary judgement ruling or even an institution decision. Thus, at the time of the Majority's Order, Patent Owner had not been given notice of or opportunity to respond to what the Majority now considers to be Petitioner's theory of public accessibility or the evidence that supports it. *See Nike, Inc. v. Adidas AG*, 955 F.3d 45, 52 (Fed. Cir. 2020) ("Although the Board was permitted to raise a patentability theory based on Spencer, the notice provisions of the APA and our case law require that the Board provide notice of its intent to rely on Spencer and an opportunity for the parties to respond before issuing a final decision relying on Spencer. Under the APA, '[p]ersons entitled to notice of an agency hearing shall be timely informed of . . . the matters of fact and law asserted,' 5 U.S.C. § 554(b)(3), and the agency 'shall give all interested parties opportunity for . . . the submission and consideration of facts [and] arguments,' *id.* § 554(c)(1)."). Moreover, most of what the Order relies on to support its supposed findings and conclusions was presented in Petitioner's Reply in Support of Motion to Submit Supplemental Information (Paper 27, "Mot. Reply"). Obviously, Patent Owner had no opportunity to respond to those arguments in its Opposition.

The Majority now places a great deal of weight on its statements in the Order that Exhibits 1016–1018 and 1020–1028 were publicly accessible by February 11, 1999, and that Exhibits 1027 and 1028 shows that the

teachings of Exhibit 1005 were published in Exhibits 1027 and 1028. Order 3–4. The Majority even goes so far as to suggest that it made express, and binding, factual findings in its Order and faults Patent Owner for not introducing rebuttal evidence. As to its supposed factual findings, they are clearly dicta, as no such findings were necessary to determine whether Exhibits 1016–1018 and 1020–1028 were relevant to Petitioner's obviousness grounds for the purpose of adding documents to the record. I would not conclude that, under 37 C.F.R. § 42.71(b), the Majority has made binding rulings on the merits of Petitioner's public accessibility theories that govern the case going forward. The issue the Majority ruled on, and what is binding on the proceeding, was whether Petitioner was allowed to submit supplemental evidence into the record. Expanding the Majority's dicta to determine that it made substantive rulings on factual and legal issues in the case, with no meaningful opportunity for Patent Owner to rebut the findings or submit contrary evidence, is unfair and contrary to the APA. *See Nike*, 955 F.3d at 52 (quoting *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016)) ("Our decisions have also set forth notice requirements relating to the parties' arguments. For instance, the Board 'must base its decision on arguments that were advanced by a party, and to which the opposing party was given a chance to respond.'").

The Majority's admonition of Patent Owner for failing to introduce rebuttal evidence, and the statement in its Order that "Patent Owner is able to argue any publication or evidentiary issues collectively with respect to Exhibits 1005, 1007, and 1016–1028 in the normal course of scheduled briefing," are especially curious given the timing of the Order and later developments in the proceeding. Patent Owner's Response (Paper 26), the

only substantive paper it could file where it could introduce affirmative evidence, was due before the Order (Paper 28) was issued and, indeed, was due before the Reply to the Opposition to the Motion (Paper 27) was filed. Thus, the Patent Owner Response could not have responded to any findings or legal conclusions in the Order. And even if the timing had been different, the Patent Owner Response is supposed to respond to the Petition, not the Order or the Motion. *See* 35 U.S.C. § 316(a)(8); Consolidated Trial Practice Guide ("Consolidated Practice Guide")[12] 65–66 (Nov. 21, 2019).

Patent Owner's next substantive paper was the Sur-reply. This paper had two important limitations pursuant to our rules: 1) "A sur-reply may only respond to arguments raised in the corresponding reply" and 2) A sur-reply "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). As to the first limitation, the extent of the Reply on Handley's prior art status was:

> Since the filing of the POR, the Board granted Petitioners' Motion to Submit Supplemental Information. *See* Paper 28. There, the Board confirmed that Handley was publicly accessible by February 11, 1999, thus, confirming Handley is at least pre-AIA 35 U.S.C. §§102(a) and 102(b) prior art. Paper 28, 3.

Reply 2. Patent Owner responded to this in the way it was permitted to do so, by arguing that "[t]he Board could not have ruled that Handley is prior art in the context of a motion to submit supplemental information—Petitioners did not request that relief and the Board did not grant it." Sur-reply 3. Patent Owner's Sur-reply was not permitted to respond to the

[12] Available at https://www.uspto.gov/TrialPracticeGuideConsolidated.

arguments presented in the Motion, as Petitioner did not make those arguments in the Reply, and Patent Owner could not have submitted rebuttal evidence (i.e., "deposition transcripts of the cross-examination of any reply witness") as there were no witnesses offered in the Reply as to this issue. Rule 42.23(b). I would not fault Patent Owner for following our rules and responding to, and limiting its response to, what was raised in the Reply. To the extent that Petitioner attempts to incorporate by reference the Order and, by virtue of incorporating the Order further incorporate the Motion, that would be a violation of our rules. *See* 37 C.F.R. § 42.6(a)(3).[13] Once again, the Majority does not explain whether it has waived that rule on behalf of Petitioner or give Patent Owner an opportunity to contest that waiver.

I also disagree with the Majority's conclusion that Exhibit 1005, the Handley reference included with and argued in the Petition, is a printed publication by virtue of some of its material having been published as a different document (Exhibit 1028) in a journal. As the Majority acknowledges, assuming that Exhibit 1005 was an earlier draft of Exhibit 1028, material was added, other material was deleted, the article was re-titled, and an author was added. It appears that, for whatever reason, Petitioner submitted and argued the wrong document in the Petition. Now, Petitioner wants a mulligan, but without making a correction to the

[13] Petitioner was six words shy of its word limit for the Reply. *See* 37 C.F.R. § 42.24(c)(1). If Petitioner did include its arguments in the Reply, it would have had to have foregone other arguments. Thus, its incorporation by reference appears to be an attempt to circumvent the word limit provided by our rules.

Petition.[14] Instead of correcting the Petition, Petitioner engages in a bait-and-switch, attempting to substitute Exhibit 1028 for Exhibit 1005. I would not find support for this in *Valve Corp. v. Ironburg Inventions Ltd.*, 8 F.4th 1364 (2021). In that case, the Federal Circuit determined that a printout of an online document was an authentic copy[15] of the same documents that were later retrieved using the Wayback Machine and included in prosecution histories, despite the printout bearing a date of access that did not appear on the Wayback Machine copy and the prosecution history copies missing images due to how the copies were downloaded and printed. 8 F.4th at 1370–72. Those copies of the identical document, although retrieved and printed at different times, could be used to show that the asserted printout was publicly accessible. *Id.* at 1374–75. The Federal Circuit did not rule that a later-retrieved document could be used to show that a non-identical earlier draft of the document was publicly accessible.

The Petition was required to "identif[y], in writing and with particularity, . . . the evidence that supports the grounds for the challenge to each claim, including—(A) copies of patents and printed publications that the petitioner relies upon in support of the petition." 35 U.S.C. § 312(a)(3). Petitioner did so, identifying Exhibit 1005, Handley, in the Petition. Pet. 4–5. I would not let Petitioner have a do-over, and an out-of-time opportunity to correct the Petition, by substituting Exhibit 1028 for Exhibit 1005. For

[14] A correction to the Petition might have resulted in a change of its filing date. Since Petitioner filed the Petition on the last day before a statutory bar would have attached, a change in filing date would have resulted in a denial of the Petition as time-barred. 35 U.S.C. § 315(b).
[15] Although the Federal Circuit evaluated authenticity under Federal Rule of Evidence 901, neither party here raises authenticity as an issue.

these reasons, I would not find that Petitioner has met its burden to show that Handley is a prior art printed publication and, thus, I would find that Petitioner has not shown, by a preponderance of the evidence, that any claims of the '682 patent would have been obvious over Handley.

I also would not find that Petitioner has met its burden to show that PacketCable is a printed publication. As an initial matter, Petitioner does not articulate, in the Petition or the Reply, a theory as to how PacketCable would have been made available to skilled artisans in December of 1999. This is important because "there are many ways in which a reference may be disseminated to the interested public," *In re Hall*, 781 F.2d 897, 898–99 (Fed. Cir. 1986), and "[w]hether a reference is publicly accessible is determined on a case-by-case basis based on the 'facts and circumstances surrounding the reference's disclosure to members of the public,'" *In re Lister*, 583 F.3d 1307, 1311 (Fed. Cir. 2009) (quoting *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004)). Petitioner's theory of how PacketCable would have been made available, not the Majority's, should be what guides our analysis of the evidence Petitioner advances. *See SAS Inst., Inc. v. Iancu*, 584 U.S. 357, 358 (2018) ("[T]he petitioner's petition, not the Director's discretion, should guide the life of the litigation."); *Axonics, Inc. v. Medtronic, Inc.*, 75 F.4th 1374, 1380 (Fed. Cir. 2023) ("An IPR is an expedited administrative procedure, driven by the invalidity theories presented in a petition.").

In the Petition, Petitioner simply cited PacketCable and stated, without evidentiary support, that it was "published December 1, 1999," that it "is at least pre-AIA 35 U.S.C. §§ 102(a) and 102(b) prior art," and that "a detailed overview is provided in the Declaration of Dr. Houh, which is

incorporated by reference." Pet. 4–5. Citing to CableLabs' current website, Dr. Houh testifies that CableLabs "is a non-profit Innovation and R&D lab funded by its cable industry member companies around the world, e.g., Comcast, Cox, Vodafone, and Taiwan Broadband Communications." Ex. 1003 ¶ 61. Dr. Houh then reproduced statements from PacketCable that he concludes illustrate "the object of the technical report." *Id.* (citing Ex. 1007, 9, 47). Specifically, PacketCable states:

> The PacketCable project is aimed at defining interface specifications that can be used to develop interoperable equipment capable of providing packet-based voice, video and other high-speed multimedia services over hybrid fiber coax (HFC) cable systems utilizing the DOCSIS protocol. . . .
>
> The objective of the PacketCable Architecture Technical Report is to provide a high level reference framework that identifies the functional components and defines the interfaces necessary to implement the capabilities detailed in the individual PacketCable specifications as listed in section 2.3.

Ex. 1007, 9. Dr. Houh does not testify as to any personal knowledge of CableLabs or PacketCable; rather, as he does with Handley, he testifies that he "ha[s] been informed that . . . PacketCable qualif[ies] as prior art under 35 U.S.C. § 103 for the purposes of this IPR." *Id.* ¶ 58. In other words, as with Handley, it was publicly accessible because the lawyers told him so.

In the Preliminary Reply, Petitioner articulated its theory to be that "PacketCable includes reliable indicia on its face (i.e., copyright, dated revision history/release, date, and consecutive footer date stamps) and bears no suggestion that it was not intended for public distribution (EX1007 at 1–3)." Prelim. Reply 3 (citing *Nobel Biocare Servs. v. Instradent USA*, 903 F.3d 1365, 1377 (Fed. Cir. 2018)). Thus, Petitioner's theory of public

accessibility appears to be that PacketCable was publicly accessible because it looks like it would have been publicly accessible. The Majority endorses this boot-strapping, but I would not.

At the institution stage, the Majority credited Dr. Houh's testimony and found it to be "consistent with the markers of publication that PacketCable bears." Dec. 26–27 (citing Ex. 1007, 1–3, 9, 55; Ex. 1003 ¶ 61). In addition to the passages cited by Dr. Houh, the Majority relied on statements in PacketCable that the document "is a cooperate effort undertaken at the direction of Cable Television Laboratories, Inc. (CableLabs®) for the benefit of the cable industry," and "describes the architecture framework for PacketCableTM networks including all major system components and network interfaces necessary for delivery of PacketCable services." Dec. 26–27 (quoting Ex. 1007, 1, 2; citing Ex. 1007, 9). The Majority concluded that "[t]hese indicia further corroborate Petitioner's sufficient showing for institution that CableLabs intended to disseminate the document at least to the listed member companies of the project and artisans of ordinary skill in those companies seeking to design and/or sell applicable networks." *Id.* at 27. In the Reply, Petitioner argues that PacketCable "includes reliable indicia of publication on its face" and that "a standard's purpose is to be adopted and infers public accessibility." Reply 2–3 (citing Ex. 1007, 1). Here, Petitioner cites to PacketCable's inclusion of a 1999 copyright date, a December 1, 1999, "release" date, 12/01/99 footer date stamps, and a statement that it is a cooperative effort undertaken for the benefit of the cable industry. *Id.* The Majority considers these indicia and concludes that the purpose of PacketCable, as reflected in these indicia, is sufficient to show public accessibility.

I do not agree that we can find a document to be a printed publication merely because it looks like the kind of document that would have been made public. The Federal Circuit has not held that information on the face of a document, without more, is sufficient to show that the document was publicly accessible. *Nobel Biocare* does not stand for that proposition. In *Nobel Biocare*, the Federal Circuit affirmed the Board's reliance on testimony from attendees of a public conference who obtained the prior art dental implant catalog at issue from the conference. 903 F.3d at 1376–77. The date on the face of the catalog, as well as the Board's finding that the dental catalog was the type of document that would be publicly disseminated at a conference, were additional evidence that the catalog in question was, in fact, the catalog the witnesses obtained at the conference. *Id.* There is no suggestion in *Nobel Biocare* that the stated date and purpose of the document, absent testimonial evidence that it was actually acquired at the conference, would have been substantial evidence of public accessibility.

Weber, Inc. v. Provisur Technologies., Inc., 92 F.4th 1059 (Fed. Cir. 2024), also does not support the Majority's conclusion. In *Weber*, the Federal Circuit found an operating manual to have been publicly accessible, not because it looked accessible, but because "Weber employees testified that the operating manuals could be obtained either upon purchase of the Weber food slicer or upon request directed to a Weber employee," and because "Weber's declarants provided actual examples of deliveries of the operating manuals to customers." *Weber*, 92 F.4th at 1068. The appearance of the operating manual refuted a Board finding that the document would have been confidential. *Id.* at 1068–69. But the document's indicia were

not, by themselves, sufficient evidence to support a finding of public accessibility.

The Majority also relies on *Valve Corp. v. Ironbug Inventions Ltd.*, 8 F.4th 1364 (Fed. Cir. 2021). In *Valve*, the Federal Circuit's discussion of a document being intended to reach the general public was in the context of declaration and deposition testimony of the person who facilitated the publication of the article and intended that it reach the general public to promote his business. 8 F.4th at 1373–1374. It was not based simply on the appearance or purpose of the document; rather, such indicia were additional evidence consistent with all the other evidence. For example, the Board's finding was also supported by a copy of the article found on the Wayback Machine as well as findings by the Examiner of the patent challenged in *Valve*, as reflected in the prosecution history. *Id.* at 1374–76. *Suffolk Technologies, LLC v. AOL Inc.*, 752 F.3d 1358 (2014) does not support the Majority's position either; in that case, there was no dispute that the document in question was actually posted on a Usenet newsgroup and that skilled artisans were contemporaneously responding to the post, *id.* at 1365. *Jockmus v. Leviton*, 28 F.2d 812 (2d Cir. 1928), is also off-point, as, in that case, there was testimony that over 1000 copies of the document in question were actually printed.

In contrast to *Nobel Biocare*, *Weber*, *Suffolk*, and *Valve*, we have no testimony of an author, conference attendee, or member of the public who actually received a copy of PacketCable in 1999; no testimony that the document was posted on or retrieved from the Internet; no evidence of availability via the Internet on the Wayback Machine; no findings of another

fact finder such as an examiner; and, indeed, no other evidence of public accessibility beyond what is on the face of PacketCable.

The Majority notes that PacketCable lists several individuals at CableLabs and other companies that contributed to PacketCable. Ex. 1007, 55. From this, the Majority finds that CableLabs actually disseminated PacketCable, without restrictions, to those fifteen people from eleven companies in the cable industry by December 1, 1999. There is, of course, no evidence in the record to support this finding. The Majority merely speculates. Moreover, although Petitioner could have sought discovery of these individuals, but apparently did not, evidence that these fifteen individuals actually received copies of PacketCable would be insufficient, as they were the purported creators of the document. *See Samsung Electronics Co., Ltd. v. Infobridge Pte. Ltd.*, 929 F.3d 1363, 1372 (Fed. Cir. 2019) ("[A] work is not publicly accessible if the only people who know how to find it are the ones who created it."); *SRI Intern., Inc. v. Internet Sec. Systems, Inc.*, 511 F.3d 1186, 1196 (Fed. Cir. 2008) ("[T]he summary judgment record shows that only one non-SRI person, Dr. Bishop, specifically knew about the availability of the Live Traffic paper, similar to the knowledge of the thesis's availability by the three professors in Bayer. The record on summary judgment does not show that an anonymous user skilled in the art in 1997 would have gained access to the FTP server and would have freely navigated through the directory structure to find the Live Traffic paper."). Seeing no evidence that the noted fifteen individuals actually received PacketCable, I would not further speculate whether they gave the document to others in their organizations or when they might have done so.

True, "[i]f accessibility is proved, there is no requirement to show that particular members of the public actually received the information." *Jazz Pharms., Inc. v. Amneal Pharms., LLC*, 895 F.3d 1347, 1356 (Fed. Cir. 2018) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1569 (Fed. Cir. 1988)). However, Petitioner has not articulated any other theory, or supported such theory with evidence, to show public accessibility. As explained below in addressing the Hall-Ellis Declaration, there is no evidence that PacketCable was available in a library or on CableLabs' website in 1999, or that such sources would have been adequately indexed. *Cf. Blue Calypso*, 815 F.3d 1331, 1349 n.9 (Fed. Cir. 2016) ("[I]n the absence of other evidence, such as evidence that the reference was actively distributed to the public or actually retrieved by members of the public, indexing is a useful inquiry to evaluate public accessibility."). Petitioner has neither articulated nor supported any theory on how "an anonymous user skilled in the art" in 1999 would have gained access to and navigated whatever source made PacketCable available. *SRI*, 511 F.3d at 1196.

In its Motion to Submit Supplemental Information, Petitioner submitted a Declaration of a librarian, Sylvia Hall-Ellis. Paper 21, 6; Ex. 1019. Petitioner argues that this testimony "confirmed PacketCable was publicly available no later than December 1, 1999." Reply 3. Dr. Hall-Ellis testified that PacketCable "indicates a December 1, 1999, release date," and that it is currently available on CableLabs' website. Ex. 1019 ¶¶ 18–19. Dr. Hall-Ellis opined: "Based on the date recorded in the document, it is my opinion that the document titled *PacketCable™ 1.0 Architecture Framework Technical Report* was available to the public by at least December 1, 1999." *Id.* ¶ 20. The Majority credits this testimony and finds that PacketCable was

publicly accessible on CableLabs' website on December 1, 1999. Dr. Hall-Ellis's opinion, however, is based neither on her personal knowledge nor her expertise.

On cross-examination, Dr. Hall-Ellis testified that the "release" date made sense to her because "it is highly likely that the organization knows the date it released the document" and that she understood from the document itself what CableLabs meant by "released." Ex. 2009, 17:5–18:10. However, she admitted that her only personal knowledge of CableLabs' practices came from reviewing CableLabs' current website, and that she did no research as to what CableLabs' practices were in 1999. *Id.* at 19:4–20:18. Dr. Hall-Ellis does not have any personal knowledge of who drafted PacketCable. Ex. 2009, 12:19–22. She also has no personal knowledge of CableLabs' processes for releasing technical documents in 1999, or what "release" meant to them (and she was not personally aware of CableLabs in 1999). *Id.* at 37:21–39:3. She also testified that she knew that PacketCable would have been released to CableLabs' members, but admitted that this conclusion was based on reading CableLabs' current website, and that she did not know who those members were. *Id.* at 20:16–22:13, 24:9–12, 30:18–31:8. Dr. Hall-Ellis also testified that CableLabs released PacketCable to the public by putting it online, on CableLabs' website, by December 1, 1999, but admitted that she had no evidence of this, other than the document appearing on the website today. *Id.* at 25:2–18, 28:9–30:17.

Dr. Hall-Ellis is an expert in the field of library science and information resources. Ex. 1010 ¶¶ 6–8. She does not testify to any expertise in the cable industry in 1999. Thus, her testimony as to how CableLabs created and made available information in 1999, and, more

broadly, how skilled artisans in the cable industry in 1999 shared information, is not based on her expertise and should not be given any weight. *See Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 592, (1993) ("Presumably, this relaxation [in FED. R. EVID. 702] of the usual requirement of firsthand knowledge—a rule which represents 'a 'most pervasive manifestation' of the common law insistence upon 'the most reliable sources of information,' ' is premised on an assumption that the expert's opinion will have a reliable basis in the knowledge and experience of his discipline." (internal citation omitted)); FED. R. EVID. 701 ("If a witness is not testifying as an expert, testimony in the form of an opinion is limited to one that is: (a) rationally based on the witness's perception."). I would find that Dr. Hall-Ellis's opinions are not based either on her expertise or her perception; thus, I would give her opinions no weight.

As to matters within her expertise, Dr. Hall-Ellis testified that she searched the Wayback Machine and library cataloging resources (e.g., WorldCat) for PacketCable and did not find it as of December 1, 1999. 25:19–26:8, 36:13–15. She further testified that she has no knowledge of whether or how PacketCable was cataloged, on CableLabs' website or elsewhere. *Id.* at 50:5–13, 51:10–52:8. This testimony is credible, as it is within her expertise. Thus, I believe Dr. Hall-Ellis that no sources typically consulted by librarians cataloged or recorded PacketCable in 1999. When her expertise is considered, all Dr. Hall-Ellis has been able to establish is that there is no evidence that PacketCable was stored or cataloged, in 1999, in the places where a librarian was apt to look.

Finally, the Majority finds that a member of the intended audience was capable of gaining access to PacketCable, even if PacketCable was not

available on the Internet nor in a library, by requesting a copy of PacketCable from CableLabs on or after December 1, 1999. The Majority cites no record evidence to support this finding, and I see none. Nor does the Majority explain how an anonymous user in 1999 would have been made aware of PacketCable such that they would have known to ask for it. *Cf. SRI*, 511 F.3d at 1196–97 ("It is . . . doubtful that anyone outside the review committee would have been aware of the paper or looked for it at all in early August 1997.").

For these reasons, I would not find that Petitioner has met its burden to show that PacketCable is a prior art printed publication and, thus, I would find that Petitioner has not shown, by a preponderance of the evidence, that any claims of the '682 patent would have been obvious over combinations including PacketCable.

Accordingly, I dissent.

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