

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ADOBE, INC.,
Petitioner
v.

REALTIME ADAPTIVE STREAMING LLC,
Patent Owner.

IPR2019-00712
Patent 8,929,442 B2

Before, GEORGIANNA W. BRADEN, GREGG I. ANDERSON, and
KAMRAN JIVANI, *Administrative Patent Judges*.

ANDERSON, *Administrative Patent Judge*.

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

I. INTRODUCTION

In this *inter partes* review under 35 U.S.C. § 314, Adobe, Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) pursuant to 35 U.S.C. §§ 311–19 to institute an *inter partes* review of claims 1–15 (“challenged claims”) of U.S. Patent 8,929,442 B2 (Ex. 1001, the “’442 patent”)¹, filed on December 19, 2013. Realtime Adaptive Streaming LLC (“Patent Owner”) filed a Preliminary Response (Paper 6). We instituted an *inter partes* review of all challenged claims (Paper 9, “Inst. Dec.”). After institution, Patent Owner filed a Patent Owner Response (Paper 17, “PO Resp.”), Petitioner filed a Reply (Paper 22, “Reply”), and Patent Owner filed a Sur-reply (Paper 23, “Sur-reply”). An oral hearing was held on June 11, 2020, and a transcript made of record (Paper 29, “Tr.”).

The Petition is supported by the Declaration of Dr. Clifford Reader (Ex. 1003, “Reader Declaration”). The Reply is supported by the Declaration of Dr. Clifford Reader in Support of the Petitioner’s Reply (Ex. 1029, “Reader Reply Declaration”). The deposition of Dr. Reader was taken by Patent Owner after the Reader Declaration (Ex. 2002). The Response is supported by the Declaration of Kenneth A. Zeger, Ph.D. in Support of Patent Owner’s Response (Ex. 2001, “Zeger Declaration”). The deposition of Dr. Zeger was taken by Petitioner after the Zeger Declaration (Ex. 1030).

¹ Without conceding the date, Petitioner alleges that the ’442 patent’s “earliest possible priority date” is the filing date of provisional application No. 60/268,394 (“’394 application”) of February 13, 2001. Pet. 4 & n.1; *see also* Ex. 1001, code (60), 1:15–16 (identifying the ’394 application as related). The prior art references relied on were either filed or published prior to this date. *See* Section I.E below. Patent Owner does not dispute that the references relied on are prior art.

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed below, Petitioner has shown by a preponderance of the evidence that claims 1–15 of the '442 patent are unpatentable.

II. BACKGROUND

A. Real Parties in Interest

The parties identify Adobe, Inc. and Realtime Adaptive Streaming, LLC as the real parties in interest. Pet. 87; Paper 3, 1.

B. Related Matters

Petitioner advises us that the '442 patent is the subject of the following actions and administrative proceedings: *Realtime Adaptive Streaming v. Adobe Sys. Inc.*, Case No. 2-18-cv-09344 (C.D. Cal.); *Realtime Adaptive Streaming LLC v. Samsung Elecs. Co.*, Case No. 6-18-cv-00113 (E.D. Tex.); *Realtime Adaptive Streaming LLC v. Adobe Sys. Inc.*, Case No. 1-18-cv-10355 (D. Mass.); *Realtime Adaptive Streaming LLC v. Apple Inc.*, Case No. 1-17-cv-02869 (D. Colo.); *Realtime Adaptive Streaming LLC v. Sony Elecs. Inc.*, Case No. 1-17-cv-01693 (D. Del.); *Realtime Adaptive Streaming LLC v. Polycom Inc.*, Case No. 1-17-cv-02692 (D. Colo.); *Realtime Adaptive Streaming LLC v. Brightcove Inc.*, Case No. 1-17-cv-01519 (D. Del.); *Realtime Adaptive Streaming LLC v. Haivision Network Video Inc.*, Case No. 1-17-cv-01520 (D. Del.); *Realtime Adaptive Streaming LLC v. Cisco Sys. Inc.*, Case No. 6-17-cv-00591 (E.D. Tex.); *Realtime Adaptive Streaming LLC v. Amazon.com Inc.*, Case No. 6-17-cv-00549 (E.D. Tex.); and *Sony Corp. v. Realtime Adaptive Streaming LLC*, Case No. IPR2018-01439 (PTAB).² Pet. 87–88.

² Dismissed. See '1439 IPR, Paper 10.

Patent Owner advises us of the “following proceedings that may affect, or be affected by,” a decision in this proceeding: *Realtime Adaptive Streaming LLC v. Haivision Network Video Inc.*, Case No. 1-17-cv-01520 (D. Del.); *Realtime Adaptive Streaming LLC v. Adobe Systems Inc.*, Case No. 1-18-cv-10355 (D. Mass); and *Realtime Adaptive Streaming LLC v. Arris Solutions, Inc.*, Case No. 19-cv-00585 (D. Colo.). Paper 3, 2.

C. Technology and the '442 Patent

The '442 patent describes “a system and method for compressing and decompressing based on the actual or expected throughput (bandwidth) of a system employing data compression and a technique of optimizing based upon planned, expected, predicted, or actual usage.” Ex. 1001, 7:51–56.

1. Technology

The field of the invention is data compression and decompression. *Id.* at 1:22–23. There are a variety of known data compression algorithms where one or more parameters are changed, resulting in an associated change in performance. *Id.* at 1:32–36. Lempel-Ziv is “a typical dictionary based compression algorithm.” *Id.* at 1:36–38. The size of the dictionary can affect performance resulting in a longer time to execute. *Id.* at 1:38–41. “Algorithms that compress particularly well usually take longer to execute whereas algorithms that execute quickly usually do not compress particularly well.” *Id.* at 1:54–56. One of several problems identified is the need to “provide dynamic modification of compression system parameters so as to provide an optimal balance between execution speed of the algorithm (compression rate) and the resulting compression ratio.” *Id.* at 1:57–61.

2. '442 Patent (Ex. 1001)

The '442 patent selects an appropriate compression algorithm for a particular application by balancing speed of compression against efficiency, i.e., the compression ratio. Ex. 1001, 8:4–12. Higher compression ratios result in “smaller compressed data sizes and greater storage capacity.”

Ex. 1003 ¶ 18. A problem for storage systems is that an optimal compression ratio is often too slow and hinder data read/write operations. *Id.* (citing Ex. 1001, 5:11–55).

The claimed method and apparatus of the '442 patent selects compression routines using a “controller [that] tracks and monitors the throughput (data storage and retrieval) of a data compression system and generates control signals to enable/disable different compression algorithms when, e.g., a bottleneck occurs so as to increase the throughput and eliminate the bottleneck.” Ex. 1001, 9:55–59. The '442 patent equates throughput to bandwidth. *Id.* at code (57) (“compressing and decompressing data based on an actual or expected throughput (bandwidth) of a system”); *see also id.* at 1:51–56, 9:12–14.

The '442 patent explains that:

two categories of compression algorithms are defined—an “asymmetrical” data compression algorithm and a “symmetrical[”] data compression algorithm[s]. An asymmetrical data compression algorithm is referred to herein as one in which the execution time for the compression and decompression routines differ significantly. In particular, with an asymmetrical algorithm, either the compression routine is slow and the decompression routine is fast or the compression routine is fast and the decompression routine is slow. Examples of asymmetrical compression algorithms include dictionary-based compression schemes such as Lempel-Ziv.

Ex. 1001, 9:61–10:4.

The '442 patent then describes “symmetry” and “asymmetry” in the context of compression and decompression.

[S]ymmetry may be defined in terms of overall effective bandwidth, compression ratio, or time or any combination thereof. In particular, in instances of frequent data read/writes, bandwidth is the optimal parameter for symmetry. In asymmetric applications such as operating systems and programs, the governing factor is net decompression bandwidth, which is a function of both compression speed, which governs data retrieval time, and decompression speed, wherein the total governs the net effective data read bandwidth.

Id. at 10:16–24.

Figure 1 of the '442 patent is reproduced below.

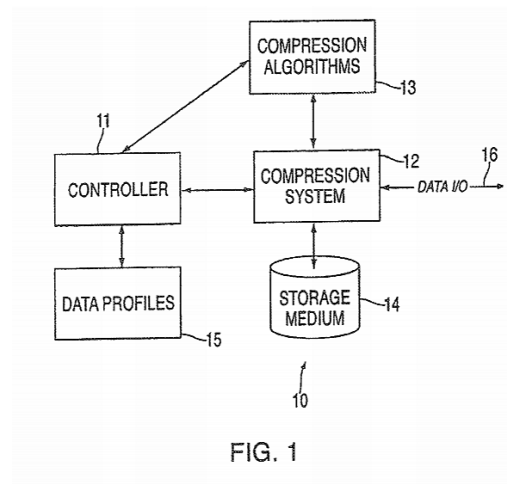


FIG. 1

Figure 1 is “a high-level block diagram [that] illustrates a system for providing bandwidth sensitive data compression/decompression according to an embodiment of the present invention.” Ex. 1001, 10:31–34. Figure 1 illustrates “a host system 10 comprising a controller 11 (e.g., a file management system), a compression/decompression (or data compression) system 12, a plurality of compression algorithms 13, a storage medium 14, and a plurality of data profiles 15.” *Id.* at 10:34–38. The “controller tracks

and monitors the throughput (e.g., data storage and retrieval)” of the system and when the throughput of the system falls below a predetermined threshold, the system generates control signals to enable/disable different compression algorithms. *Id.* at 10:42–45. “In one embodiment, the system throughput that is tracked by the controller 11 preferably comprises a number of pending access requests to the memory system.” *Id.* at 10:43–45.

Still referring to Figure 1, “[t]he data compression system 12 is operatively connected to the storage medium 14 using suitable protocols to write and read compressed data to and from the storage medium 14.” Ex. 1001, 10:46–48. “The data compression system 12 may maintain the compressed data to be stored on the storage medium 14 and the decompressed data that is retrieved from the storage medium 14 for subsequent data processing, storage, or transmittal.” *Id.* at 10:64–11:1. Data compression system 12 may receive compressed or uncompressed data via I/O (input/output) port 16 from a remote location or transmit the data to another network device for remote processing or storage. *Id.* at 11:1–8.

D. Illustrative Claim

Independent claims 1 and 8 of the challenged claims are independent claims to a method and apparatus, respectively. Claims 2 through 7 depend directly or indirectly from claim 1. Claims 9 through 15 depend directly or indirectly from claim 8.

Claim 1 is reproduced below as illustrative.

1. [1.0]³ A method comprising:

³ We adopt Petitioner’s format, sometimes omitting the brackets, for labeling the claim limitations. Petitioner identifies the claim number followed by numbers for each limitation after the preamble, which is numbered limitation 1.0. *See* Pet. 15. Patent Owner follows the same

[1.1] decompressing at least a portion of a compressed data block that was selected from among a plurality of compressed data blocks,

[1.2] wherein at least a portion of a data block having video or audio data was compressed with one or more compression algorithms selected from among a plurality of compression algorithms based upon a throughput of a communication channel and a parameter or an attribute of the at least the portion of the data block to create one or more of the plurality of compressed data blocks; and

[1.3] storing at least a portion of the decompressed data block.

Ex. 1001, 20:6–17.

E. Evidence

Tso, US 6,185,625 B1, filed December 20, 1996, issued February 6, 2001 (Ex. 1004).

Vishwanath, US 6,216,157 B1, filed June 17, 1998, issued April 10, 2001 (Ex. 1005).

Kidder, US 5,898,833, filed December 31, 1996, issued April 27, 1999 (Ex. 1006).

Petitioner further relies on the Reader Declaration (Ex. 1003) and the Reader Sur-reply Declaration (Ex. 1029). *See* Section I above. Patent Owner also relies on the Zeger Declaration (Ex. 2001). *Id.*

F. Asserted Challenges to Patentability

In the Institution Decision, we instituted trial on the following challenges:

format, excluding the brackets. PO Resp. 13 (limitation 1.2). The inclusion of Petitioner’s formatting and/or brackets does not impact our analysis.

Claims Challenged	35 U.S.C. § ⁴	Reference(s)/Basis
1–15	102	Tso
1–15	103	Tso
1–15	103	Vishwanath, Kidder

Inst. Dec. 25–44.

III. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner alleges a person of ordinary skill in the art at the time of the invention would have

had a bachelor’s degree in electrical engineering, computer engineering, computer science, or the equivalent and 2–3 years of work experience with real-time systems implementing data compression, storage retrieval, processing, and transmission, or the equivalent.

Pet. 7 (citing Ex. 1003 ¶¶ 97–99). Patent Owner adopts this definition for purposes of this proceeding. PO Resp. 6–7 (citing Ex. 2001 ¶¶ 26–28). We adopted this definition in the Institution Decision and maintain it for this Decision. *See* Inst. Dec. 27.

B. Claim Construction

In an *inter partes* review requested in a petition filed on or after November 13, 2018, we apply the same claim construction standard used in district courts in a civil action under 35 U.S.C. § 282(b), namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83

⁴ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103. Because the effective filing date of the ’442 patent is before the effective date of the relevant amendment, the pre-AIA version of § 103 applies.

Fed. Reg. 51,340, 51,343 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018) (now codified at 37 C.F.R. § 42.100(b) (2019)). In this case, the Petition was filed on February 27, 2019, and we, therefore, apply the district court standard here. In so doing, we construe a claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b). “[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.” *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *see also Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

Both parties propose constructions for “asymmetric”/“compression algorithms is asymmetric.” Reply 1; PO Resp. 7. The parties have separate proposals for construing “throughput.” Reply 2; Sur-reply 3–4.

1. “asymmetric”/“compression algorithms is asymmetric”

We preliminarily construed “asymmetric”/“compression algorithms is asymmetric” to mean “a compression algorithm . . . in which the execution time for the compression and decompression routines differ significantly.” Inst. Dec. 15–16. The construction is not in dispute because both parties agree to the construction from the Institution Decision. Reply 1–2; PO Resp. 7. For completeness of the record, we adopt the agreed upon construction for purposes of this Decision.

2. “throughput”

During the course of the trial, a dispute arose between the parties regarding construction of the term throughput. Petitioner proposes that

“throughput of a communication channel” should be construed to mean “a rate of transmission of data.” Reply 8–9 (citing Ex. 1029 ¶¶ 19–27). Patent Owner’s proposal for “throughput” is “the amount of data flowing through a data channel.” Sur-reply 3–5 (citing Ex. 2001 ¶ 2001).

The claim language at issue is “one or more compression algorithms selected from among a plurality of compression algorithms *based upon a throughput of a communication channel*.” The claims require “throughput” is “of a communication channel,” which does not favor either proposal. The claim language of the ’442 patent does not suggest any specific measurement of “throughput”, e.g., rate or amount, and does not support either parties’ proposed construction.

As Petitioner notes, the Specification “recites various types of throughputs such as: ‘actual throughput,’ ‘expected throughput,’ ‘desired throughput,’ ‘system throughput,’ ‘overall throughput,’ ‘optimum throughput,’ and ‘required/requested data throughput’ that allow ‘optimiz[ation] based upon planned, expected, predicted, or actual’ throughput.” Reply 5 (citing Ex. 1001, code (57), 1:22–30, 7:52–56, 9:11–28, 10:43–45, 11:28–2, 12:25–27, 13:47–61). Patent Owner argues the throughput types refer to “the amount of data flowing through a data channel,” supporting its proposed construction. Sur-reply 4–5 (citing Ex. 2001 ¶ 79).

Patent Owner argues the Specification uses “the term ‘throughput’ as a synonym for ‘usage’ of a communication channel or the data flowing through a channel.” Sur-reply 7. In support of its proposed construction, Patent Owner argues that Specification describes “throughput” as including the “*number* of pending transmission requests over the communication

channel,” the “*number* of pending access requests to a storage device,” and “the *number* of pending disk accesses (access requests) to determine whether a bottleneck is occurring.” *Id.* at 8 (citing Ex. 1001, 8:25–27, 8:18–20, 13:35–39) (emphasis added). Patent Owner does not explain why the “number” of pending actions related to transmission require us to conclude that “throughput” should be construed as limited to “the amount of data flowing through a data channel.”

The prosecution history of the application for the ’442 patent is of record here. *See* Ex. 1002. Neither party points to any evidence from the prosecution history as supportive of their respective proposals.

The understanding of what “bandwidth” means is relevant to the construction of “throughput” because “bandwidth” is related to “throughput.” Indeed, as Petitioner alleges, the ’442 patent equates “throughput” and “bandwidth.” Reply 7–8 (citing Ex. 1001, 7:57–8:3 (“system and method for compressing and decompressing based on the actual or expected throughput (bandwidth) of a system employing data compression”); *see also id.* at 8 (citing Zeger Deposition, 45:2–9 (“at least in the abstract, where they have the ‘bandwidth’ as a parenthetical, that is being used synonymously with ‘throughput.’”)). With reference to the Specification’s disclosure of “throughput (bandwidth),” Patent Owner argues that “the term ‘bandwidth’ can inform what the appropriate construction and understanding of the term ‘throughput’ would be.” Tr. 50:2–5. We determine that, as used in the ’442 patent, “throughput” equates to and means the same as “bandwidth.” *See* Ex. 1001, Abs., 7:57–8:3, 9:11–14.

Patent Owner cites extrinsic evidence in the form of the Zeger Declaration and argues we should adopt one of three understandings⁵ a person of ordinary skill would have had of the term “bandwidth.” Ex. 2001 ¶¶ 78–79. The understanding of “bandwidth” asserted by Dr. Zeger, and relied on by Patent Owner for its proposed construction, is “the amount of data flowing through a data channel.” PO Resp. 28–29 (citing Ex. 2001 ¶ 78). However, the second listed understanding of “bandwidth” is capacity “measured in bits per second,” i.e., the “rate of transmission of data” and is the construction proposed by Petitioner. Neither the Zeger Declaration, Patent Owner Response, nor the Sur-reply explain why the other two understandings of “bandwidth” are inapplicable here. Rather, Patent Owner summarily argues the third understanding of “bandwidth” (“the amount of data flowing through a data channel”) is the “correct interpretation” and the second understanding (capacity “measured in bits per second”) is not. Tr. 48:17–50:16.

The United States Court of Appeals for the Federal Circuit requires that declarant testimony “cannot be used as a wholesale substitute for reasoned analysis and evidentiary support.” *Arendi v. Apple*, 832 F.3d 1355, 1361–1362 (Fed. Cir. 2016). Our Trial Practice Guide cautions, “in an

⁵ “(1) the difference between the largest and smallest frequencies in a band of spectrum, i.e., the width of the frequency band (for example, ‘AM radio stations use 10 KHz bandwidths.’); and (2) the capacity of a communications channel, measured in bits per second, i.e., the maximum amount of data that could potentially be transmitted across the channel. For example: ‘Some fiber optic internet connections have bandwidths up to 10 Gigabits per second.’ And (3) bandwidth may also be used to refer to the amount of data flowing through a data channel, which is upper bounded by the maximum capacity of the channel.” Ex. 2001 ¶ 78; PO Resp. 28–29.

obviousness analysis, conclusory assertions from a third party about general knowledge in the art cannot, without supporting evidence of record, supply a limitation that is not evidently and indisputably within the common knowledge of those skilled in the art.” Trial Practice Guide,⁶ 36 (citing *K/S Himpp v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1365 (Fed. Cir. 2014)). Patent Owner’s unsupported argument is not persuasive and we determine that “bandwidth” includes “rate of transmission of data.”

Patent Owner argues other alleged “closely-related patents” support Patent Owner’s proposed construction for the claims here. Sur-reply 9–10. Patent Owner’s purported support for its construction is based on different claims of allegedly related patents challenged in other *inter partes* review proceedings.⁷ *Id.* For example, Patent Owner points to claims from U.S. Patent No. 7,386,046 (“’046 patent”). *Id.* at 9. The relationship to the ’442 patent is not explained. The ’046 patent claim term is “tracking the throughput.” *Id.* The claims here do not recite “tracking.”

Patent Owner argues our construction of these claims in the ’1222 IPR, which also challenges claims of the ’442 patent, is “incompatible” with Petitioner’s proposed construction. Sur-reply 10. The construction in the ’1222 IPR is preliminary. The preliminary construction is further qualified in specifying that “throughput” includes “*at least* the number of pending transmission requests.” *Id.* (citing ’1222 IPR, Paper 7, 13–14) (emphasis

⁶ Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019) (“Trial Practice Guide”), available at <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf>

⁷ *Netflix, Inc. v. Realtime Adaptive Streaming, LLC*, IPR2019-00209; *Google LLC v. Realtime Adaptive Streaming, LLC*, IPR2019-01033; *ARRIS Solutions, Inc. v. Realtime Adaptive Streaming, LLC*, IPR2019-01222 (“’1222 IPR”).

added). Neither proposed construction here is precluded by the preliminary finding in the '1222 IPR.

As discussed above (*see* n.5), one understanding of “bandwidth” asserted by Patent Owner is

(2) the capacity of a communications channel, *measured in bits per second*, i.e., the maximum amount of data that could potentially be transmitted across the channel. For example: “Some fiber optic internet connections have bandwidths up to *10 Gigabits per second*.”

PO Resp. 28 (citing Ex. 2001 ¶ 78) (emphasis added). This understanding comports with Petitioner’s proposed construction of “throughput.”

Petitioner cites extrinsic dictionary evidence defining “throughput” as additional support for its construction. *See* Reply 4 (citing Ex. 1027,⁸ 1179 (“data transmission” defined as: “[t]he total capability of equipment to process or transmit data during a specified time period.”)); Ex. 1028,⁹ 519 (“throughput” defined as: “[t]he data transfer rate of a network, measured as the number of bits per second transmitted” or “[a] measure of the data processing rate in a computer system.”). Thus, we construe “throughput” to include, but not limited to, “a rate of transmission of data.” It is not necessary to determine whether Patent Owner’s proposed construction is also included in the construction of “throughput” because no issue here turns on whether “throughput” also includes “the amount of data flowing through a data channel.” *See* Section III.F.3.c below (Patent Owner arguing “rate of transmission of data” is not “throughput”).

⁸ IEEE, THE AUTHORITATIVE DICTIONARY OF IEEE STANDARDS TERMS, (7TH Ed. 2000).

⁹ Microsoft Corporation, MICROSOFT COMPUTER DICTIONARY (5th Ed. 2002).

C. Legal Standard for Anticipation

Anticipation “requires that every element and limitation of the claim was previously described in a single prior art reference, either expressly or inherently, so as to place a person of ordinary skill in possession of the invention.” *Sanofi-Synthelabo v. Apotex, Inc.*, 550 F.3d 1075, 1082 (Fed. Cir. 2008) (citing *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1379 (Fed. Cir. 2003); *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1267–69 (Fed. Cir. 1991)).

“[U]nless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102.” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008). Whether a claim is invalid as anticipated is a two-step inquiry. *See Power Mosfet Tech., LLC v. Siemens AG*, 378 F.3d 1396, 1406 (Fed. Cir. 2004). The first step requires construction of the claim. *Id.* The second step in the analysis requires a comparison of the properly construed claim to the prior art. *Id.*

D. Legal Standard for Obviousness

A patent claim is invalid as obvious if the differences between the claimed subject matter 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.” *See* 35 U.S.C. § 103(a).

“The ultimate determination of obviousness is a question of law, but that determination is based on underlying factual findings.” *In re Nuvasive*,

Inc., 842 F.3d 1376, 1381 (Fed. Cir. 2016). The underlying factual findings include: (1) “the scope and content of the prior art”; (2) “differences between the prior art and the claims at issue”; (3) “the level of ordinary skill in the pertinent art”; and (4) “the presence of secondary considerations of nonobviousness such” “as commercial success, long felt but unsolved needs, failure of others,” and unexpected results. *Id.* (citing, *inter alia*, *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966)).

“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner 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). Furthermore, in assessing the prior art, the Board must consider whether a person of ordinary skill would have been motivated to combine the prior art to achieve the claimed invention. *Nuvasive*, 842 F.3d at 1381. As the Federal Circuit has noted, in quoting from the Supreme Court’s decision in *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418–419 (2007), “‘because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known,’ ‘it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.’” *Personal Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 991–992 (Fed. Cir. 2017).

E. Alleged Anticipation/Obviousness of Claims 1–15 Over Tso

Petitioner alleges claims 1–15 would have been “anticipated and/or rendered obvious by Tso.” Pet. 4, 15–53 (emphasis omitted). The Petition is supported by the Reader Declaration. Ex. 1003 ¶¶ 126–238.

1. Tso (Ex. 1004)

Tso describes “[a] system for enhancing data access over a communications link.” Ex. 1004, code (57). The system retrieves an object over a computer network having a remote scaling server, a network client, a remote proxy, and an encode service provider. *Id.*

An encode service provider selectively encodes or scales, i.e., compresses, an object based on a predetermined characteristic thereof, such as a datatype. Ex. 1004, 2:60–62.¹⁰ Greater compression rates are achieved “without negatively affecting software that ultimately processes the compressed data.” *Id.* at 2:63–66. Higher compression rates may be achieved by “reducing the quality of a picture and/or by using compression techniques tuned for specific datatypes.” *Id.* at 2:66–3:2. “For example, representing certain types of images, such as photographic images, using JPEG or fractal compression algorithms may result in a 10x improvement in compression rate over the popular GIF format.” *Id.* at 3:2–6. The system can “actively control the trade-off between download time and content quality by selecting whether or not to scale content and/or the extent of such scaling.” *Id.* at 11:44–48.

¹⁰ Both experts agree that “scaled” means “compressed.” Ex. 2001 ¶ 41; Ex. 1003 ¶ 114; *see also* Ex. 1004, 6:33–36 (The service provider has the “capability to compress and/or scale” various selection criteria.).

Figure 5 of Tso is reproduced below.

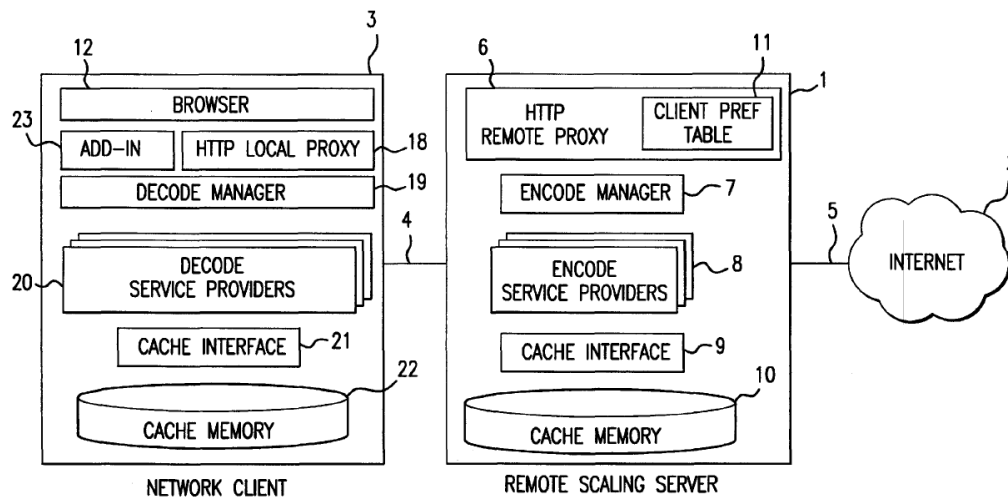


FIG.5

Figure 5 of Tso is “a schematic diagram illustrating an embodiment of the present invention directed to an enabled network client.” Ex. 1004, 3:29–31. As illustrated in Figure 5, browser 12 renders data streams having non-standard MIME (Multipurpose Internet Mail Extensions) types as they are received by network client 3. *Id.* at 9:16–21, 13:41–44. Network client 3 is in communication with remote scaling server 1 and receives requests for refinement “to obtain higher quality representations of said images.” *Id.* at 13:44–50. Network client 3 may contain specialized decoding software to support more sophisticated scaling features. *Id.* at 13:51–54.

Still referencing Figure 5, “encode manager 7 is coupled to HTTP remote proxy 6.” Ex. 1004, 6:27–28. The encode manager “controls one or more encode service providers 8 which may be used to selectively scale content based on a predetermined characteristic thereof.” *Id.* at 6:30–32. The service provider has the “capability to compress and/or scale” various selection criteria such as image, video, or HTML (HyperText Markup Language). *Id.* at 6:33–36. One example of a “predetermined selection

criteria” includes “speed and/or quality of client/server communications link 4.” *Id.* at 6:36–44.

Link speed may be determined in a variety of ways, including “by sampling the rate of one or more prior transfers of data between itself and network client 3.” Ex. 1004, 10:21–24. “If the derived link speed indicates a relatively slow communications link, HTTP remote proxy 6 may determine that all content to be transmitted to network client 3 should be scaled by default.” *Id.* at 10:33–36. A relatively fast communications link may not justify using scaling. *Id.* at 10:36–39. In either case, “HTTP remote proxy 6 records this determination in client preference table 11,” which is updated to store the link speed. *Id.* at 10:24–27, 10:40–44.

2. Claim 1

The preamble of the ’442 patent, designated limitation 1.0, recites “[a] method comprising.” Petitioner argues Tso discloses a “**method** for providing a client with an object to be rendered to a user.” Pet. 15 (citing Ex. 1004, code (57), Figs. 8–10, 21:63–22:16 (claim 21); Ex. 1003 ¶ 127). Neither party suggests, nor do we find, that the preamble is limiting. Patent Owner does not dispute that the preamble is disclosed or taught by Tso. We find Petitioner has shown persuasively that Tso discloses or teaches a method as per the preamble of claim 1.

a. Limitation 1.1

Limitation 1.1 recites “decompressing at least a portion of a compressed data block that was selected from among a plurality of compressed data blocks.” Petitioner’s annotation of Tso’s Figure 5 from page 16 of the Petition is reproduced below.

Petitioner's Annotation of Tso Fig. 5

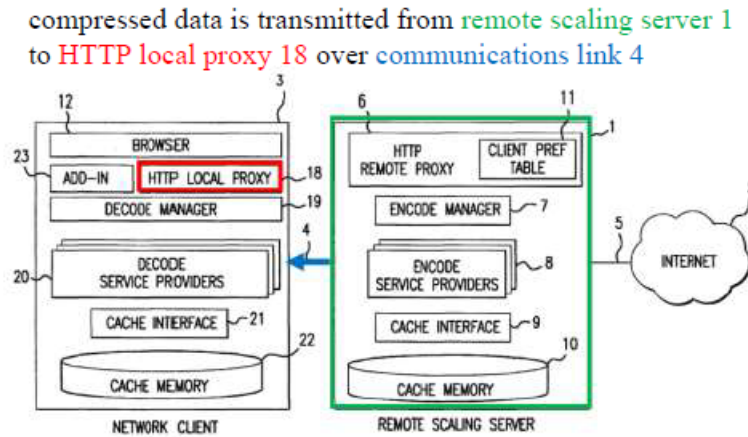


FIG.5

Figure 5 is a schematic diagram illustrating an embodiment of the invention of Tso directed to an enabled network client. Ex. 1004, 3:29–31. As shown in the annotation to Figure 5, Tso's system "includes a 'network client 3 [that] accesses Internet 2 through a remote scaling server 1' implemented as a network server." Ex. 1003 ¶ 128; *see also* Pet. 15–16 (citing Ex. 1004, 6:3–12). Petitioner argues, in part, that "Tso's server uses a compression algorithm to create compressed data blocks." Pet. 17 (citing Ex. 1004, Fig. 6 (annotated)), 22 (citing Ex. 1003 ¶ 153). Furthermore, Petitioner cites to Tso's teaching that the compressed data is received as a "block of data" and that, in addition, blocks of data would have been obvious to a person of ordinary skill. Pet. 16–17 (citing Ex. 1004, 11:6–16; Ex. 1003 ¶¶ 128–132).

Patent Owner does not dispute Petitioner's argument and supporting evidence that Tso discloses or teaches limitation 1.1. Given the entirety of the record, we find Petitioner has shown persuasively that Tso discloses or teaches a server and client encoding and decoding compressed data transmitted in data blocks, as recited in limitation 1.1.

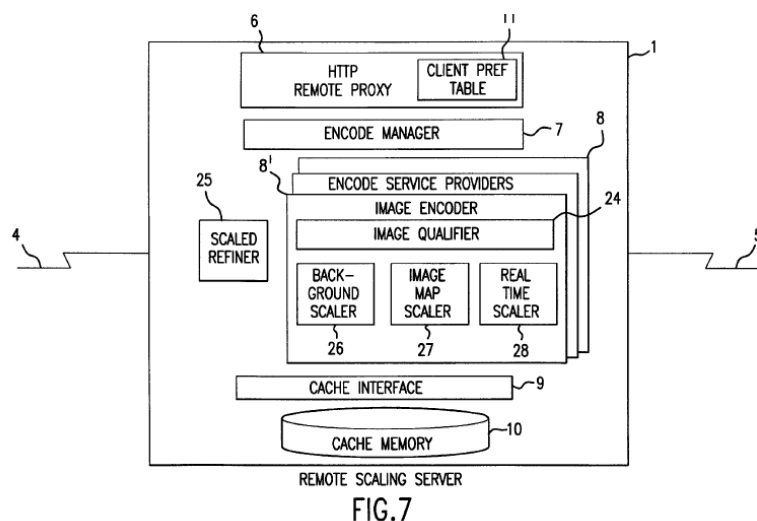
b. Limitation 1.2-Undisputed Portions

Limitation 1.2 recites:

wherein at least a portion of a data block having video or audio data was compressed with one or more compression algorithms selected from among a plurality of compression algorithms based upon a throughput of a communication channel and a parameter or an attribute of the at least the portion of the data block to create one or more of the plurality of compressed data blocks.

Petitioner alleges Tso anticipates and/or renders obvious claim 1 of the '442 patent, including limitation 1.2 reproduced above. Pet. 22. Patent Owner disputes only whether Tso discloses that portion of limitation 1.2 reciting “one or more compression algorithms selected from among a plurality of compression algorithms based upon a throughput of a communication channel.” PO Resp. 13. For the reasons discussed below, we find that Tso, as understood by a person of ordinary skill in the art, discloses limitation 1.2, including the disputed portion. See Pet. 22–29.

Figure 7 of Tso is reproduced below.



Tso’s Figure 7 is a schematic diagram of one embodiment of “an encode service provider configured to scale image data.” Ex. 1004, 3:36–38.

Petitioner argues Tso's remote scaling server shown in Figure 7 "chang[es] content received from Internet 2 prior to returning it to a requesting network client 3" by compressing the data prior to transmission. Pet. 22 (citing Ex. 1004, 10:45–11:17, 6:13–45); *see also id.* at 23 (Petitioner's annotation of Tso Figure 7).

Relying on the Reader Declaration, Petitioner argues the "server uses a compression algorithm to create compressed data blocks." Pet. 22 (citing Ex. 1003 ¶ 153). Petitioner's showing regarding the "compressed data blocks" recited in limitation 1.1 is incorporated as support for this limitation 1.2. *Id.*; *see also id.* at 15–21 (showing for limitation 1.1).

Tso teaches the encode service provider selectively scales content based on "predetermined characteristics" or selection criteria. Ex. 1004, 6:30–36. Selection criteria may include "different type of data content, such as image, video, or HTML (HyperText Markup Language)." *Id.* at 6:32–36. In addition to data type, selection criteria for selectively scaling include presentation capabilities of network client 3 and "speed and/or quality of client/server communications link 4." *Id.* at 6:36–43. Petitioner cites to the preceding disclosures of Tso to argue a person of ordinary skill would have understood Tso's objects are data blocks and compressed objects are compressed data blocks. *Id.* at 23–24 (citing Ex. 1003 ¶¶ 153–155; Ex. 1004, 6:27–45, 4:17–50, 11:6–17).

Petitioner argues that Tso's different encode service providers "may include the capability to compress and/or scale a different type of data type (i.e., a plurality of compression algorithms)." Pet. 24 (citing Ex. 1003 ¶ 156). Petitioner alleges data types associated with encode service providers include "image, video, or HTML (HyperText Markup Language)."

Id. at 24 (citing Ex. 1004, 6:27–45, 7:3–17, quoting Ex. 1004, 6:33–36).

Petitioner then argues a person of ordinary skill “would have understood that Tso uses a video encoder for compressing video data, an HTML encoder for compressing HTML data, etc.” *Id.* (citing Ex. 1003 ¶ 157).

With the above as a foundation, Petitioner argues that the portion of limitation 1.2 reciting selection of a compression algorithm “based upon . . . a parameter or an attribute of the at least the portion of the data block” is disclosed or taught by Tso’s server which “compresses requested objects ‘based on a predetermined characteristic,’ such as a ‘type of data content.’” Pet. 28 (citing Ex. 1004, 6:27–36). Petitioner also relies on the encode manager of Tso which “‘dynamically determines the content type for the data stream (*e.g.*, image/jpeg, image/gif, video/mpeg)’ and matches the content type to a particular encode service provider.” *Id.* (citing Ex. 1004, 10:60–11:4); *see also id.* (citing Ex. 1004, 10:60–11:4; Ex. 1003 ¶ 164).

Patent Owner does not dispute Petitioner’s argument and supporting evidence regarding the above elements of limitation 1.2. Based on the entirety of the record, we agree with Petitioner’s showing summarized above and find Petitioner has shown persuasively the undisputed portions of limitation 1.2 are disclosed in Tso.

c. Limitation 1.2-Disputed Portion

The central issue is whether Tso teaches simply determining whether or not to compress or, instead, discloses or teaches selecting a compression algorithm, *i.e.*, “which compression algorithm should be applied.” PO Resp. 14. Stated in the context of limitation 1.2, what is in dispute is “one or more compression algorithms selected from among a plurality of compression algorithms based upon a throughput of a communication channel.” *See* PO

Resp. 14–22; Reply 13–22; Sur-reply 13–18. That portion of limitation 1.2 reciting the selection of a compression algorithm based on “a parameter or an attribute of the at least the portion of the data block” is not disputed. *See* Section III.E.2.a above.

Preliminarily, Petitioner argues that as long as the selection is based on both “bandwidth” and a “parameter” that is sufficient and how the initial determination is made is not required. *See* Reply 13–14 (citing Ex. 1029 ¶¶ 33–34; Ex. 1030, 19:25–21:2, 10:10–30). In other words, Petitioner argues a broad interpretation of “based upon a throughput” requires only “a determination of whether to compress.” Tr. 8:8–11. We agree with Patent Owner that Petitioner’s broad interpretation reads the phrase “selected from among a plurality of compression algorithms” out of limitation 1.2. *See* Sur-reply 15. Based on the entirety of the record, Petitioner does not argue persuasively how its broad construction proposal addresses the “selected from” language. The claim clearly and unambiguously requires the selection of a compression algorithm. *See Phillips*, 415 F.3d at 1314 (claim construction unnecessary when “the ordinary meaning of claim language as understood by a person of skill in the art [is] readily apparent.”). Accordingly, we do not adopt Petitioner’s proposed construction.

We turn to whether Tso discloses or teaches compressing video or audio data “with one or more compression algorithms selected from among a plurality of compression algorithms based upon a throughput of a communications channel.” Petitioner argues Tso’s scaling server “selects a compression algorithm from among a plurality by selecting a particular encode service provider.” Pet. 22, 25 (citing Ex. 1003 ¶ 158). Petitioner argues that “Tso’s encoders are tailored to various criteria, including

‘available **network bandwidth**,’ which is a characteristic of the client/server communications link.” *Id.* at 26 (citing Ex. 1004, 3:6–14). Petitioner then alleges “Tso ‘selectively encod[es] [a requested] object based on one or more predetermined selection criteria,’ [citing Ex. 1004, claim 13] where the ‘predetermined selection criteria comprise a characteristic of the communications link’ over which the requested object is transmitted. [citing Ex. 1004, claim 16].” *Id.*

Petitioner points to the encode manager of Tso as managing the compression of data to be transmitted from the server to network client. Pet. 26 (citing Ex. 1004, 6:27–45). Petitioner argues the encode manager also controls “one or more encode service providers 8 . . . to selectively scale content based on a predetermined characteristic,” such as the “**speed and/or quality of client/server communications link 4**.” *Id.* (citing Ex. 1004, 6:27–45). Petitioner concludes that the recited selection of a compression algorithm is disclosed or rendered obvious by Tso’s encode manager’s selection of an encode service provider. *Id.* (citing Ex. 1003 ¶ 160). Furthermore, according to Petitioner, the selection of a compression algorithm is based on bandwidth, which is disclosed in Tso as “link speed.” *Id.* (citing Ex. 1004, 1:29–67; Ex. 1003 ¶ 160).

Petitioner supports its argument and evidence for the disputed limitation by citing to additional disclosures from Tso that disclose or teach automatic updates of the link speed/quality information over the communications link “to adapt to changing conditions, such as increased congestion on client/server communications link 4.” Pet. 26–27 (citing Ex. 1004, 10:11–44; *see also id.* at 27 (citing Ex. 1004, 12:1–19 (separate embodiment describing “whether and how content is to be scaled”))).

Petitioner also cites Tso’s disclosure or teaching of load balancing procedures which “result in changes to the throughput of the client/server communications link.” *Id.* at 27 (citing Ex. 1004, 13:15–22; Ex. 1003 ¶ 161). Petitioner concludes by relying on the Reader Declaration that a person of ordinary skill “would have understood that Tso uses the throughput/bandwidth of the client/server communications link—over which the compressed data is received—to select an appropriate compression algorithm to perform network load-balancing.” *Id.* (citing Ex. 1003 ¶¶ 161, 163); *see also* Pet. 22 (“server uses a compression algorithm to create compressed data blocks.”).

We agree with Petitioner and find that “link speed” is the claimed “throughput.” Reply 16 (citing Ex. 1004, 10:11–44 (“link speed” is the “speed of client/server communications link 4”), 6:13–7:17, 8:43–9:30; Ex. 1003 ¶¶ 152–165); Pet. 26 (citing Ex. 1004, 6:27–45, 1:29–67; Ex. 1003 ¶ 160). This finding is supported by Tso’s teaching that selectively scaling is based on a link speed of a communications link. *See* Reply 16 (citing Pet. 22–29; Ex. 1004, 6:13–17, 8:43–9:30; Ex. 1003 ¶¶ 152–165). This finding is consistent with our construction of “throughput” as including “a rate of transmission of data.” *See* Section III.B.2 above.

We also find Tso’s encode manager controls “one or more encode service providers 8 . . . to selectively scale content based on a predetermined characteristic,” such as the “speed and/or quality of client/server communications link 4.” Pet. 23 (citing Ex. 1004, 6:27–45; 4:17–50, 11:6–17), 26 (citing Ex. 1004, 6:27–45); Reply 17–18 (citing Ex. 1004, 6:27–45; Pet. 22–29; Ex. 1004, 6:32–36; Ex. 1029 ¶ 39). As set forth in the Petition as summarized above, we find Tso’s encode service provider may scale or

compress content, including “image, video, or HTML (HyperText Markup Language).” Ex. 1004, 6:32–36. We credit the Reader Declaration that Tso’s selection of an encoder is tailored to characteristics of the object being compressed. Ex. 1003 ¶ 157; *see also* Ex. 1004, 3:6–14 (“datatype-specific compression techniques”). In other words, the encode service provider selects different compression algorithms depending on the type of data content, “such as image, video, or HTML,” associated with other encode service providers 8.” Ex. 1004, 6:27–45. We agree with Petitioner and Dr. Reader that a person of ordinary skill “would have understood that Tso uses a video encoder for compressing video data, an HTML encoder for compressing HTML data, etc.” Pet. 24 (citing Ex. 1003 ¶ 157). We credit the Reader Declaration and find that the recited selection of a compression algorithm is disclosed or rendered obvious by Tso’s encode manager’s selection of an encode service provider. *Id.* (citing Ex. 1003 ¶ 160).

Separate from the Reader Declaration, we find Tso discloses or teaches selection of a compression algorithm. At page 19 of its Reply, Petitioner cites additional disclosure of Tso that “[the] non-enabled network client 3 may optionally be provided the ability to actively control the trade-off between down load time and content quality by *selecting whether or not to scale content and/or the extent of such scaling.*” Ex. 1004, 11:44–48 (emphasis added). The preceding was cited to specifically respond to “Realtime’s second proposition—that Tso only teaches choosing whether to compress, not which compression algorithm should be applied.” *See* Reply 16. The disclosure at column 11 beginning at line 44, like that of column 6, refers to the embodiment illustrated in Figure 2 of Tso. *See* Ex. 1004, 6:3–4 (“Referring now to FIG. 2, in a first embodiment of the

present invention . . .”), 11:17–65 (still referring to Figure 2, for example, network client 3, encode manager 7, and encode service provider 8).

At the hearing, Patent Owner argued that the citation to Tso’s column 11 at line 44 was an improper reply. Tr. 86:25–87:9. We disagree. First, Patent Owner did not raise the issue in its Sur-reply or seek to file a motion to strike, either of which would have been appropriate means for making a record supporting the argument. Second, the only asserted basis for striking the evidence was that “[t]he portion of the Tso reference here being relied upon by Petitioner wasn’t included in the petition itself.” *Id.* at 86:26–87:2. We find that the evidence was a proper response to the argument in the Response, as discussed above. *See* Reply 16; *see also* Trial Practice Guide, 74 (“Generally, a reply or sur-reply may only respond to arguments raised in the preceding brief.”); *Apple Inc. v. Andrea Electronics Corp.*, 949 F.3d 697, 706–707 (Fed. Cir. 2020) (“As we have regularly held, ‘the petitioner in an inter partes review proceeding may introduce new evidence after the petition stage if the evidence is a legitimate reply to evidence introduced by the patent owner.’” (citations omitted)).

Patent Owner disputes the Reader Declaration testimony that Tso’s “selective scaling” discloses or teaches the disputed portion of limitation 1.2. PO Resp. 14 (citing Ex. 1004, 6:27–45; Ex. 1003 ¶ 160). Patent Owner argues that column 6 of Tso, which is relied on by Dr. Reader, “teaches only the ‘yes-no dimension of the decision to compress or scale’ by Tso’s HTTP proxy server.” *Id.* at 14–15 (citing Ex. 2002,¹¹ 61:20–24, 61:17–64:16; Ex. 2001 ¶¶ 52–53).

¹¹ *Realtime Adaptive Streaming LLC, v. Adobe, Inc.*, 2:18-cv-09344 (C.D. Cal.), Deposition of Clifford Reader, Ph.D. (“Reader Deposition”).

We find Patent Owner’s argument unpersuasive. The primary support for this argument is the Zeger Declaration, which relies principally on the Reader Deposition. *See* Ex. 2001 ¶¶ 52–53. Tso is cited separately but only in conclusory fashion and then only to give context to the Reader Deposition. *See, e.g.*, Ex. 2001 ¶ 52 (citing Ex. 2002, 61:17–64:16) (“the cited disclosure teaches ‘selectively scal[ing] content’ in the sense that it uses ‘speed and/or quality of client/server communications link 4’ to select ***whether or not*** to compress content, and not ‘***how much***’ to compress it.”).

The Reader Deposition does not support Patent Owner or the Zeger Declaration opinions. Patent Owner’s only specific cite to the Reader Deposition is Dr. Reader’s understanding as to whether “‘selectively scale’ . . . means a yes-no decision or whether it’s a how-much decision.” Ex. 2002, 61:17–23. Patent Owner cites several pages of the Reader Deposition and then picks one sentence out of Dr. Reader’s answer that Tso’s disclosure is “not quite clear at this point.” PO Resp. 15 (citing Ex. 2002, 61:7–24; Ex. 2001 ¶ 53); *see also* Reply 21 (testimony regarding “selectively scaling objects”). We do not find the testimony raises any issue about the credibility of the Reader Declaration testimony at paragraphs 160 or 161.

For its second argument that Tso’s “link speed” does not disclose or teach selection of a compression algorithm, Patent Owner disputes Petitioner’s evidence from the Reader Declaration that a person of ordinary skill would have understood that Tso “uses the throughput/bandwidth of the client/server communications link,” to “select an appropriate compression algorithm to perform network load balancing.” PO Resp. 16–17 (citing Ex. 1003 ¶ 161 (citing Ex. 1004, 10:11–44, 12:1–19, 13:15–22)). Patent

Owner argues the Tso disclosures are directed only to using link speed to make a determination whether or not to compress. *Id.* at 17 (citing Ex. 2001 ¶ 58).

Patent Owner’s argument is not persuasive. Paragraph 58 of the Zeger Declaration is merely a denial of the opinions expressed in paragraph 161 of the Reader Declaration. Paragraph 161 of the Reader Declaration is in addition to what is disclosed in paragraph 160, which relies on column 6 of Tso. *See* Ex. 1003 ¶ 161 (“Additionally, Tso maintains link speed/quality information . . .”). As discussed above, we find Petitioner has shown persuasively that Tso’s column 6 teaches selection of a compression algorithm based on, *inter alia*, “link speed.” *Id.* ¶ 160 (citing Ex. 1004, 6:27–45).

We find additional support in column 10 of Tso, that “Tso uses the throughput/bandwidth of the client/server communications link—over which the compressed data is received—to select an appropriate compression algorithm to perform network load-balancing.” Ex. 1003 ¶ 161. Patent Owner argues column 10 of Tso is limited a discussion of how to calculate “link speed.” PO Resp. 17 (citing Ex. 1004, 10:11–44; Ex. 2001 ¶ 59). Patent Owner explains that column 10 describes that one method that “link speed” may be determined is by “measuring the time i[t] takes a ‘ping’ sent from HTTP remote proxy 6 to network client 3 to return to HTTP remote proxy 6.” *Id.* (citing Ex. 1004, 10:21–30). Patent Owner then asserts that link speed is used to configure client preference table 11, which in turn only determines whether to compress content or not. *Id.* (citing Ex. 1004, 10:21–44). Patent Owner asserts that “link speed” is not disclosed “in any other way, including, for example, affecting which compression algorithm is

applied or how much compression is obtained.” *Id.* at 17–18 (citing Ex. 2001 ¶ 59; Ex. 2002, 68:14–23).

Patent Owner contends that the client preference table of Tso stores IP addresses of the network client, including a value indicative of whether or not to scale the content, i.e., compress. PO Resp. 18 (citing Ex. 1004, 10:11–20 (whether or not to scale the content to be returned to network client is based on “link speed”)). Accordingly, Patent Owner asserts whether or not to compress is based on “link speed” but selection of a compression algorithm is not. *Id.* at 19 (citing Ex. 2001 ¶¶ 59–61). Patent Owner supports its argument by noting that Tso’s encode manager stores a scaled version, i.e., a compressed version, even if link speed is high enough that compression is not needed. *Id.* at 19–20 (citing Ex. 1004, 11:6–19).

The arguments relating to column 10 and the client preference table of Tso are unpersuasive because they do not respond to the contentions made in the Petition and the Reader Declaration testimony. Column 10 is cited as additional support that Tso discloses or teaches selecting a compression algorithm based, in part, on link speed. Column 10 discloses that if link speed indicates a slower communications link, the “HTTP remote proxy 6 may determine that *all content to be transmitted to network client 3 should be scaled by default.*” Ex. 1004, 10:33–36 (emphasis added). This disclosure teaches scaling takes place and the client preference table stores “derived *link speed*” (Ex. 1004, 10:31–33) and adapts to “*changing conditions.*” See Reply 14–15 (citing Ex. 1004, 10:40–44) (emphases added). Patent Owner does not explain how scaling by default or adapting to changing conditions is *only* a determination of whether to scale or compress. As taught in column 10 of Tso just described, we find that “Tso

teaches not only choosing whether or not to scale, but also choosing ‘the extent of such scaling,’ based upon network conditions such as the ‘speed and/or quality of client/server communications link.’” *Id.* at 18–19 (citing Ex. 1029 ¶ 78).

Patent Owner argues Petitioner’s and Dr. Reader’s reliance on columns 12 and 13 of Tso is “flawed for similar reasons” to those asserted above for column 10. PO Resp. 20 (citing Ex. 1004, 12:1–19, 13:15–22; Ex. 1003 ¶ 161; Ex. 2001 ¶¶ 63–64). The column 12 disclosure is directed to a graphical user interface of Tso shown in Figure 3, which shows a “SCALING INTERFACE.” *Id.* However, column 12 describes Figure 3, which is a different embodiment from what Petitioner relies on in columns 6 and 10 of Tso. *See* Ex. 1004, 12:1–3 (“In this embodiment, as illustrated in FIG. 3 . . .”); *see also* Tr. 58:11–10 (Patent Owner confirming Tso column 12 is a different embodiment from column 6). We do not rely on the embodiment disclosed in column 12 to support this Decision. The argument, therefore, is not persuasive.

According to Patent Owner column 13 of Tso describes Figure 3’s “SCALING INTERFACE” and a JavaScript implementation for updating the user preference table based on changing conditions related to, for example, “increased congestion on client/server communications link 4.” PO Resp. 22 (citing Ex. 1003, 13:1–22, 10:40–41 (regarding congestion); Ex. 2002, 71:3–22; Ex. 2001 ¶ 67). This argument is not persuasive for the same reasons discussed in connection with column 12 above.

Petitioner characterizes Patent Owner’s argument as “throughput” alone is determinative of which compression algorithm should be applied. Reply 12 (citing PO Resp. 16). We accept Patent Owner’s representation

that its argument is not based only on “throughput.” *See* Sur-reply 13–14. There is no dispute, and we find, that a person of ordinary skill would have read limitation 1.2 as requiring the algorithm selection to be based upon *both* “bandwidth” and a “parameter or attribute.” *See* Section III.E.2.a above.

Based on the entirety of the record, we find Petitioner has shown persuasively that Tso discloses or teaches the subject matter of limitation 1.2.

d. Limitation 1.3

Limitation 1.3 recites “storing at least a portion of the decompressed data block.” Among other showings, Petitioner cites Tso’s network as including “a client-side cache memory 22” in which ““the decompressed/translated data stream’ is stored.” Pet. 29 (citing Ex. 1004, 13:51–65, 15:53–65 (“The decompressed/translated data stream may then be simultaneously stored in client-side cache memory 22.”); Ex. 1004, Fig. 5 (annotated) above (cache memory 22)).

Patent Owner does not dispute Petitioner’s argument and supporting evidence regarding the above elements of limitation 1.3. Based on the entirety of the record, we find Petitioner has shown persuasively that Tso discloses storing compressed data blocks, as recited in limitation 1.3.

Based on the entire record before us, we find Petitioner has shown persuasively that Tso discloses the method of independent claim 1.

3. Dependent Claim 7

Claim 7 depends from claim 1 and recites “wherein the at least the portion of the compressed data block was compressed, prior to decompression, based upon a user command.” Like claim 1, claim 7 does

not include the term the “compression algorithm is asymmetric,” which is recited in dependent claim 2. *See* Section III.E.4 below.

Petitioner argues Tso’s compression and decompression process is initiated when a user “requests” an object. Pet. 42 (citing Ex. 1004, 9:3–60). Tso teaches that the user’s request is transmitted as “an HTTP request for the . . . object to remote scaling server 1 over client/server communications link 4.” Ex. 1004, 9:44–60. Petitioner argues that “[o]nce the request is received at remote scaling server 1, encode manager 7 of the server selectively compresses the data based on a predetermined characteristic.” Pet. 42–43 (citing Ex. 1004, 6:13–45, 9:60–11:5; Ex. 1003 ¶ 204).

Patent Owner argues claim 7 is patentable for the reasons argued in connection with claim 1 but does not otherwise dispute Petitioner’s argument and supporting evidence that Tso discloses or teaches claim 7. PO Resp. 44. Based on the entirety of the record before us, we find Petitioner has shown persuasively that Tso discloses or teaches the compressing data prior to decompressing that data, as recited in claim 7.

4. Dependent Claim 2

Claim 2 depends from claim 1 and recites “wherein at least one of the plurality of compression algorithms is asymmetric.” The asymmetric term was construed above in Section III.B.1.

Petitioner argues “at least one of Tso’s plurality of compression algorithms is asymmetric.” Pet. 29 (citing Ex. 1003 ¶ 169). For example, Petitioner argues “Tso discloses compression algorithms for particular data types, including “video/mpeg” [Ex. 1004, 10:60–65] and ‘fractal compression.’” *Id.* (citing Ex. 1003 ¶ 169; Ex. 1004, 3:2–13, 11:39–43, 14:33–41, 16:20–46, 16:58–17:2, 17:55–18:20).

Patent Owner argues claim 2 is patentable for the reasons argued in connection with claim 1 but does not otherwise dispute Petitioner's argument and supporting evidence that Tso discloses or teaches claim 2. PO Resp. 44. Based on the entire record before us, we find Petitioner has shown persuasively that Tso discloses or teaches asymmetric compression algorithms, as recited in claim 2.

5. Independent Claim 8

We have reviewed Petitioner's arguments regarding claim 8. *See* Pet. 28–41; Ex. 1003 ¶¶ 208–220. Claim 8 is an independent apparatus claim of similar scope to claim 1. Petitioner relies on much of its arguments for claim 1 in asserting claim 8 is unpatentable. *See* Pet. 28–41.

Exemplary of Petitioner's analysis for claim 8 is its analysis of limitation 8.1, which recites “a data decompression system configured to decompress a compressed data block.” Limitation 1.1 is similar in reciting “decompressing at least a portion of a compressed data block.” Petitioner incorporates its showing for limitation 1.1 to show limitation 8.1. Pet. 45. Similarly, Petitioner's arguments for limitations 8.2 and 8.3 incorporate the arguments for limitations 1.3 and 1.2, respectively. *Id.* at 46–48.

Limitation 8.4 recites the same language as used in dependent claim 2, analyzed above. Petitioner relies on the arguments made for claim 2 for limitation 8.4. Pet. 48 (citing Ex. 1003 ¶¶ 219–220).

Patent Owner disputes Petitioner's argument and supporting evidence that Tso discloses or teaches independent claim 8 for the same reasons it argued with respect to limitation 1.2, which argument of Patent Owner we find unpersuasive. PO Resp. 45. Based on the entire record before us, we

find Petitioner has shown persuasively that Tso discloses or teaches independent claim 8.

6. Dependent Claims 3–6 and 9–15

As discussed above in Section III.E.1–5, we have determined that Petitioner has sufficiently shown all the limitations of independent claims 1, 2, 7, and 8 are disclosed or taught by Tso. We have reviewed Petitioner’s argument and supporting evidence challenging patentability of claims 3–6 and 9–15. Pet. 71–78, 83–87; Ex. 1003 ¶¶ 174–202, 221–238.

Patent Owner disputes Petitioner’s argument and supporting evidence that Tso discloses or teaches claims 3–6, which depend from claim 1, and 9–15, which depend from claim 8, for the same reasons it argues with respect to claims 1 and 8, which argument of Patent Owner we find unpersuasive. PO Resp. 44–45. Based on the entirety of the record, we find Petitioner has shown persuasively that Tso discloses or teaches claims 3–6 and 9–15.

7. Single Reference Obviousness of Claims 1–15 Over Tso

Patent Owner argues that the Reader Declaration testimony alone is insufficient to establish obviousness over Tso. PO Resp. 26–27. As discussed above, Tso alone anticipates the challenged claims. Petitioner does not specifically argue inherency, but it argues that, if the disputed portion of limitation 1.2 is not anticipated, selecting “a compression algorithm based upon throughput,” would have been obvious to a person of ordinary skill. *See* Pet. 26 (citing Ex. 1004, 6:27–45; Ex. 1003 ¶ 160).

Patent Owner’s argument, based in part on the Reader Deposition, focuses on the lack of testimony that a person of ordinary skill “would modify Tso.” *See* PO Resp. 26 (citing Ex. 2002, 75:17–22; Ex. 2001 ¶ 73). Patent Owner argues “Petitioner’s single-reference obviousness theory is

both unexplained and unsupported by anything other than conclusory statements.” Sur-reply 19 (citing *Arendi*, 832 F.3d at 1361–1363). Petitioner responds that modification is unnecessary and Tso “at least implicitly” discloses or teaches the arguably missing limitation to a person of ordinary skill. *See* Reply 22–23 (citing Pet., 17–22, 34–36; Ex. 1003 ¶¶128–151, 185–187).

Arendi is inapposite because it decided a missing limitation could not be found based on “common sense” alone. *Arendi*, 832 F.3d at 1361. In addition, *Arendi*’s expert evidence was not specifically directed to the missing limitation. *Id.* at 1365. Neither is the case here. *See* Ex. 1003 ¶ 160 (Tso’s “encode manager 7 selects an encode service provider 8 and corresponding compression algorithm based on the bandwidth/throughout of the client/server communications link.”). The Reader Declaration is not conclusory but rather is based on specific disclosures of Tso. *Id.* (citing Ex. 1004, 6:27–45, 1:29–67).

Petitioner’s argument is supported by Federal Circuit case law. Reply 22 (citing *Monsanto Tech. LLC v. E.I. DuPont de Nemours & Co.*, 878 F.3d 1336, 1346 (Fed. Cir. 2018)). *Monsanto* is an appeal of an *inter partes* review and is similar to the facts here. The Federal Circuit held that petitioner’s expert declaration on anticipation was not prior art and instead was extrinsic evidence used to support what is “necessarily present” in a prior art’s teaching. *Monsanto*, 878 F.3d at 1345. Furthermore, the extrinsic evidence of the expert was not rebutted. *Id.* at 1346. Here, Patent Owner’s only expert rebuttal by Dr. Zeger is directed to the Reader Deposition testimony. *See* Ex. 2001 ¶ 73. The Zeger Declaration does not rebut the Reader Declaration testimony that Tso, alone and without modification,

would teach or suggest to a person of ordinary skill selecting a compression algorithm based upon a throughput. Neither paragraph 73 nor any other testimony from the Zeger Declaration present evidence of a lack of motivation for us to consider. Instead, the Zeger Declaration addresses only that the Reader Declaration, as the Reader Deposition acknowledges, does not assert any modification of Tso. *See* Ex. 2001 ¶ 73.

Petitioner has not argued that a motivation for modifying Tso is necessary. Reply 23 (citing Ex. 1029 ¶ 47). Indeed, Petitioner does not rely on combining elements from Tso to find obviousness. Rather, the exact same disclosure of Tso that is asserted for anticipation is relied on for obviousness. Pet. 26 (citing Ex. 1003 ¶ 160); *see also* Reply 23 (citing Ex. 1029 ¶¶ 46–48).

“A disclosure that ‘anticipates under § 102 also renders the claim invalid under § 103, for anticipation is the epitome of obviousness.’” *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1373 (Fed. Cir. 2019). Motivation for combining two references is not necessary where one anticipates, even if anticipation is not alleged. *Id.* We find the holdings of *Monsanto* and *Realtime* support our conclusion that motivation is unnecessary to find obviousness here based on a single reference. *Monsanto* focused on the expert testimony and, motivation was required to “combine elements” of the prior art. *Realtime* supports a conclusion that there is, under circumstances such as relevant here, a thin line between obviousness and anticipation.¹² Petitioner here relies on the same disclosure for

¹² The thin line is illustrated by *Cont’l*, 948 F.2d at 1268–1269 (Anticipation determination may be supported by “technological facts known to those in the field of the invention.”). Knowledge of those in the field, “is not,

anticipation and obviousness and the claims and alleges, if not anticipated, the claims would have been obvious.

Based on the entire record before us, we find Petitioner has shown persuasively that Tso would have taught or suggested to a person of ordinary skill that selecting a compression algorithm based upon a throughput of a communications channel would have been obvious. Thus, Petitioner has shown by a preponderance of the evidence that claims 1–15 would have been obvious over Tso.

8. Summary (Ground 1)

We determine Petitioner has shown by a preponderance of the evidence that Tso anticipates or renders obvious claims 1–15.

F. Alleged Obviousness of Claims 1–15 Over Vishwanath and Kidder

Petitioner alleges claims 1–15 would have been obvious over Vishwanath and Kidder. Pet. 4, 53–87. Petitioner also relies on the Reader Declaration to support its position. See Ex. 1003 ¶¶ 239–350.

1. Vishwanath (Ex. 1005)

Vishwanath describes modifying an output based on characteristics of application data and of the medium of transmission in a client-server system. Ex. 1005, code (57), 1:9–13. “[T]he client decodes the adapted output to produce a modified version of the interactive application that is adapted for the client.” *Id.* at 2:38–41. The adapted output may be a selected compression algorithm dependent upon one characteristic, including speed or bandwidth of the transmission medium. *Id.* at 5:64–6:5, 6:50–61.

however, a substitute for determination of patentability in terms of § 103.” *Cont’l*, 948 F.2d at 1269.

Compression algorithms are selected based on input data type and decompressed by a decoder. *Id.* at 7:1–4.

In one embodiment, Vishwanath describes a server side and a client side connected through a transmission medium. Ex. 1005, 4:47–49. Figure 2 of Vishwanath is reproduced below.

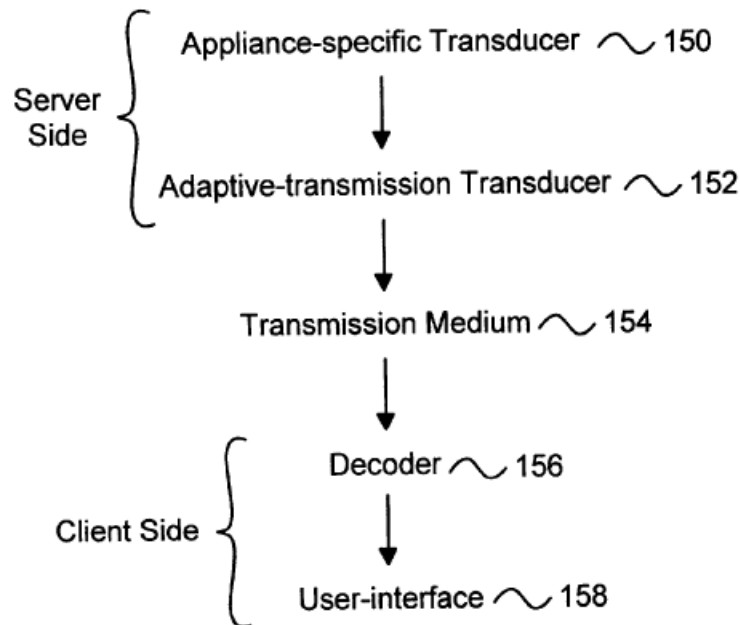


Figure 2 illustrates the server side and the client side of Vishwanath's invention connected through a transmission medium. Ex. 1005, 3:36–38. “[T]he server side includes an appliance specific transducer 150 and an adaptive-transmission transducer 152.” *Id.* at 4:51–53. Appliance-specific transducer 150 and adaptive-transmission transducer 152 modify respectively an application based on the capability of the client and transmission medium 154. *Id.* at 4:53–57.

Types of applications modified by the adaptive transmission include documents, internet (including “streaming multimedia”), email, and forms. Ex. 1005, 5:4–11. Similarly, the transmission medium delivering the

application may be modified based on “the bandwidth, acceptable error rates, and the latency of the transmission medium.” *Id.* at 2:62–64, 3:14–17, 4:27–33, 5:67–6:5.

Adaptive-transmission transducer 152, as described above, uses the characteristics of the application and transmission medium 154 to modify appliance-specific output 179 to generate adapted output 183. Ex. 1005, 4:53–57. “After the appliance-specific output 179 is modified to generate the adapted output 183, the server sends the adapted output 183 through the transmission medium to the client.” *Id.* at 6:5–8. Generally, selection of the compression algorithm is done in an adaptive manner. *See, e.g., id.* at 7:21–24.

The transmission transducer includes multimode compressor 250 and adaptive packetizer 252. Ex. 1005, 6:8–12. The packetizer selects the network protocol to generate the adapted output. *Id.* at 6:12–14. Multimode compressor 250 also may automatically select “the compression algorithm in view of the application, the transmission medium 154 and the client.” *Id.* at 6:33–35. Parameters used to select the compression algorithm may include input data type and bandwidth versus quality. *Id.* at 6:50–61. Compression algorithms disclosed include H.263 and MPEG 1 and 2. *Id.* at 6:62–67.

2. Kidder (Ex. 1006)

Kidder describes a method and apparatus where “a network client requests multiple downloads of a video clip stored on the network server.” Ex. 1006, code (57). “In response to each request, the network server compresses the video clip and transmits the compressed data in a scalable bitstream.” *Id.*

The apparatus described improves the quality of graphic or audio information over a network. Ex. 1006, code (57). In one embodiment, a network client requests multiple downloads of a video clip stored on the network server, “compresses the video clip[,] and transmits the compressed data in a scalable^[13] bitstream.” *Id.* The server uses “H.263 or MPEG [compression standards] for compressing the data to be transmitted.” *Id.* at 6:48–50.

Kidder explains that it is desirable to improve “the quality of a transmitted video clip by increasing the effective bandwidth available for the transmission and playback of the video clip” and to use cached data to “improve the quality of subsequent viewing instances.” Ex. 1006, 2:37–42. “[A] node coupled to the network receives and stores a first set of data which represents a data object and receives a second set of data which represents the data object.” *Id.* at 2:47–49. Kidder receives compressed data, decompresses the data, and stores the decompressed data in a cache. *Id.* at 7:2–8:28.

3. *Claim 1*

Petitioner argues Vishwanath describes the preamble of claim 1, a “method comprising,” by teaching a “[*m*]ethod . . . to deliver an application to a client.” Pet. 58 (citing Ex. 1005, Abstract, Fig. 3, claims 10–13). If limiting, Patent Owner does not dispute Petitioner’s argument and supporting evidence that Vishwanath teaches the preamble. Based on the

¹³ The Reader Declaration asserts that “scaled” means “compressed.” Ex. 1003 ¶ 114.

entire record, we find Petitioner has shown persuasively that Vishwanath teaches the preamble of claim 1.¹⁴

a. Limitation 1.1

Limitation 1.1 recites “decompressing at least a portion of a compressed data block that was selected from among a plurality of compressed data blocks.” Petitioner relies on Vishwanath’s teaching of a client that communicates with a server over a transmission medium. Pet. 60–61 (citing Ex. 1005, 4:46–51, annotated Fig. 2). Petitioner further argues “Vishwanath’s client ‘generat[es a] modified version of an application from [the] adapted [i.e., compressed] output’ [Ex. 1005, 2:54–59] by decoding it with decoder 156.” *Id.* at 61 (citing Ex. 1005, 2:22–42, claims 12–13). Petitioner relies on the understanding of a person of ordinary skill relating to transmission of packets as including selected data blocks of variable size. *Id.* at 62 (citing Ex. 1003 ¶¶ 48–88, 257–261; Ex. 1001, 7:3–7 (files are comprised of data blocks); Ex. 1005, 7:61–8:23 (“Incremental reconstruction of the output at the client.”)).

Petitioner cites to both Vishwanath and Kidder as teaching “receiving compressed data as a stream, and decompressing the stream of data.” Pet. 63 (citing Ex. 1005, 5:1–12, 7:18–42, 7:61–8:22; Ex. 1006, 6:25–47, 7:2–8:28). Relying on the Reader Declaration, Petitioner contends a person of ordinary skill would understand a data stream to include a plurality of compressed blocks. *Id.* at 63–64 (citing Ex. 1003 ¶¶ 265–268 (citing

¹⁴ Petitioner also cites to Kidder as teaching various limitations. *See, e.g.*, Pet. 59 (Kidder also describes a method). Unless otherwise stated, for purposes of this Decision we analyze only Vishwanath.

Ex. 1005, 5:1–12, 7:18–42, 7:61–8:22; Ex. 1006, 6:25–47, 7:2–8:28;
Ex. 1014,¹⁵ Abstract, 5:27–31; Ex. 1024,¹⁶ 3:33–54)).

Patent Owner does not dispute Petitioner’s argument and supporting evidence that Vishwanath teaches limitation 1.1. Based on the record before us, we find Petitioner has shown persuasively that Vishwanath teaches a server and client encoding and decoding compressed data transmitted in data blocks, as recited in limitation 1.1.

b. Limitation 1.2-Undisputed Portions

Limitation 1.2 recites:

wherein at least a portion of a data block having video or audio data was compressed with one or more compression algorithms selected from among a plurality of compression algorithms based upon a throughput of a communication channel and a parameter or an attribute of the at least the portion of the data block to create one or more of the plurality of compressed data blocks.

Pet. 64.

Petitioner cites to Vishwanath’s teaching of “many different types of media,” including audio and video. Pet. 64 (citing Ex. 1005, 2:10–13, 5:4–11, 6:50–57). Petitioner argues Vishwanath shows one or more compression algorithms because, among other showings, “Vishwanath’s transducer selects, as illustrated in FIG. 7, an ‘appropriate compression algorithm’ [Ex. 1005, 6:7–15] to apply to the requested data from among ‘[a] number of compression algorithms[] applicable,’ including ‘LZ . . . MPEG1, MPEG2, [and] H.263.’” *Id.* at 65 (citing Ex. 1005, 6:32–37).

¹⁵ Kalmanek et al., EP 0739138 A2; published April 10, 1996.

¹⁶ Porter et al., U.S. 6,519,286 B1; issued February 11, 2003.

Petitioner further argues “Vishwanath’s system selects a compression algorithm based on parameters such as ‘[i]nput data type’ and available network bandwidth.” Pet. 66 (citing Ex. 1005, 6:50–62, Fig. 9B). According to Petitioner, compression of the data block “based upon a throughput of a communication channel” is shown because Vishwanath “seeks to improve data quality and user experience over varying transmission media” and automatically modifies the requested data based on “the resources available.” *Id.* (citing Ex. 1005, 1:9–13, 2:60–3:33). In addition, Petitioner contends Vishwanath “selects a compression algorithm for a particular application based on parameters, such as the type of data within the application in addition to available network bandwidth.” *Id.* at 67 (citing Ex. 1005, 6:50–62).

Patent Owner does not dispute any of the preceding argument and supporting evidence regarding limitation 1.2. We agree with Petitioner’s showing summarized above and find Petitioner has shown persuasively the undisputed portions of limitation 1.2.

c. Limitation 1.2-Disputed Portion

Patent Owner disputes that Vishwanath teaches selecting a compression algorithm based upon “throughput.” *See* PO Resp. 28–34; Reply 24–27; Sur-reply 20. Patent Owner does not contest that Vishwanath teaches the remainder of limitation 1.2. *See* Section III.F.3.a above.

We frame the disputed issue as follows. Patent Owner argues that Petitioner’s construction of “throughput” as “a rate of transmission of data” is not correct. *See* Section III.B.2 above. Specifically, Patent Owner argues that Vishwanath teaches “channel capacity,” which is not the same as “throughput.” *See* PO Resp. 28–30. Furthermore, Patent Owner argues that Vishwanath’s disclosure of “bandwidth” is not the recited “throughput.” *Id.*

at 30–34; *see, e.g.*, 31–32 (citing Ex. 2001 ¶¶ 82–83 (“the word ‘bandwidth’ in Vishwanath refers to the channel capacity (i.e. maximum possible throughput)”). For reasons discussed below, these arguments are not persuasive.

Petitioner argues “compression selection is based on ‘the *bandwidth* [i.e., throughput] . . . of the transmission medium.’” Pet. 67 (citing Ex. 1005, 2:62–64, 6:50–67). In addition, Petitioner contends Vishwanath “selects a compression algorithm for a particular application based on parameters, such as the type of data within the application in addition to available network bandwidth.” *Id.* at 67 (citing Ex. 1005, 6:50–62). Petitioner argues Vishwanath shows one or more compression algorithms because, among other showings, “Vishwanath’s transducer selects, as illustrated in FIG. 7, an ‘appropriate compression algorithm’ [Ex. 1005, 6:7–15] to apply to the requested data from among ‘[a] number of compression algorithms[] applicable,’ including ‘LZ . . . MPEG1, MPEG2, [and] H.263.” *Id.* at 65 (citing Ex. 1005, 6:32–37).

Patent Owner first argues a person of ordinary skill “would not equate the term ‘throughput’ in the context of the ’442 patent claims with Vishwanath’s disclosure of channel capacity.” PO Resp. 28–30 (citing Ex. 2001 ¶ 77. Relying on the Zeger Declaration, Patent Owner identifies three separate understandings¹⁷ a person of ordinary skill would have for the term “bandwidth.” *Id.* at 28–30 (citing Ex. 2001 ¶¶ 78–79); *see also id.* at 29–30 (citing Ex. 1005, 7:65–8:3, 8:33–36, 9:56; Ex. 2001 ¶ 79) (arguing ’442 patent describes other methods for controlling “throughput”). Patent Owner alleges Dr. Reader’s testimony “incorrectly assumes that the

¹⁷ These “understandings” were discussed generally in Section II.B.2 above.

claimed ‘throughput’ is the same thing as channel capacity (which may be an alternative definition of “bandwidth”), which does not and cannot be changed by a compression algorithm or routine.” *Id.* at 30 (citing Ex. 2001 ¶ 80). Based on the preceding, Patent Owner contends “throughput” “is not limited to and not the same thing as the capacity (i.e., maximum throughput) of a given channel.” *Id.* at 29.

Neither the ’442 patent nor Dr. Reader use the term “channel capacity” in conjunction with “throughput” or otherwise. *See* Reply 25. Dr. Zeger does use the term but, without any support, attributes it to Dr. Reader. *See* Ex. 2001 ¶¶ 77, 80. Indeed, Petitioner asserts, and we agree, it is Patent Owner that is incorrect. *Id.* at 24. Petitioner re-alleges its proposed construction that “throughput” means “a rate of transmission of data.” *Id.* at 25; *see also* Section III.B.2 above (adopting Petitioner’s construction). That the Zeger Declaration is based on a mistaken understanding of the Reader Declaration causes us to give it little weight on this point. *See id.* (Patent Owner “‘therefore applies an incorrect understanding’ to its analysis of the Petition’s and Dr. Reader’s arguments.”) (citing PO Resp. 28; Ex. 2001 ¶ 77). Other than alleging generally “bandwidth” is not “throughput,” Patent Owner has no response to the assertion that it has “an incorrect understanding.” *See* Sur-reply 20.

Patent Owner argues next that “Vishwanath’s discussion of ‘bandwidth’ is not the ‘throughput of a communications channel’ in the ‘442 patent claims.” PO Resp. 30–34. Patent Owner argues Vishwanath’s teachings of “bandwidth” should be interpreted to mean “channel capacity,” the “maximum possible throughput.” *Id.* at 31 (citing Ex. 1005, 1:27–31, 7:51–53 (both describing bandwidth differences based on transmission

medium); Ex. 2001 ¶ 82 (Vishwanath’s use of “bandwidth” means channel capacity and does not use the word “throughput”).

Patent Owner argues Vishwanath does not teach “throughput” as it proposes we construe the term. PO Resp. 31–33 (citing Ex. 2001 ¶¶ 83–85). Patent Owner attempts to rebut the Reader Declaration by arguing Dr. Reader’s citations to Vishwanath do not teach selection of a compression algorithm based on “any consideration of the amount of data flowing through the communication channel,” asserting Patent Owner’s construction of “throughput.” *Id.* at 32–33 (citing Ex. 2001 ¶¶ 83–85). Patent Owner further attempts to distinguish Vishwanath’s “bandwidth” teaching from “how the term is used in the ’442 patent,” contending the Reader Declaration “incorrectly equates . . . ‘bandwidth’” to “throughput.” *Id.* at 33 (citing Ex. 2001 ¶¶ 83–86).

Patent Owner’s arguments based on its construction of “throughput” are also not persuasive because we determine that “throughput” includes “bandwidth” measured at a rate of transmission, i.e., bits per second. *See* Section III.B.2 above. Patent Owner relies all but exclusively on the Zeger Declaration and its rebuttal of the Reader Declaration. *See, e.g.*, PO Resp. 33 (citing Ex. 2001 ¶¶ 83–86). As discussed above, the Zeger Declaration contains an error which causes us to give it little weight relating to what Vishwanath teaches. Beyond the error, the Zeger Declaration simply repeats the allegations in the Patent Owner Response and does not provide sufficient basis for us to find it supports Patent Owner’s position. Conversely, we find the Reader Declaration credible.

We find substantial evidence from the ’442 patent that “bandwidth,” which Vishwanath discloses, is the equivalent of “throughput.” *See*,

Ex. 1001, 1:25, 7:54, 9:13 (“throughput (bandwidth)”); *see also* Pet. 66–67 (citing Ex. 1005, 2:62–64, 6:50–67) (“the parameters used to choose the compression algorithm include . . . the compromise between bandwidth versus quality”); Ex. 1003 ¶¶ 271, 273; Ex. 1029 ¶¶ 55–57 (person of ordinary skill “would have equated Vishwanath’s discussion of ‘bandwidth’ with the claimed ‘throughput of a communications channel.’”). Again, other than alleging generally “bandwidth” is not “throughput,” Patent Owner has no response. *See* Sur-reply 20.

Based on the entire record, we find Petitioner has shown persuasively that Vishwanath teaches the subject matter of limitation 1.2.

d. Limitation 1.3

Limitation 1.3 recites “storing at least a portion of the decompressed data block.” Petitioner relies on Kidder’s teaching that decompressed data is stored in a cache. Pet. 68 (citing Ex. 1006, 7:2–8:28). Patent Owner does not dispute that Kidder teaches limitation 1.3 but does dispute that a person of ordinary skill would have combined Kidder with Vishwanath. PO Resp. 34–44.

Petitioner cites Kidder to teach limitation 1.3. Pet. 68–70. Petitioner argues that “Vishwanath does not explicitly describe storage of the decompressed data,” as recited in limitation 1.3. *Id.* at 68. According to Petitioner, Kidder meets the storage limitation by teaching receipt of “compressed data, decompresses the data, and stores the decompressed data in a cache.” *Id.* (citing Ex. 1006, 7:2–8:28). Patent Owner argues Petitioner has not shown how and why Vishwanath and Kidder would have been combined. PO Resp. 34–44.

Petitioner argues the reason a person of ordinary skill would have been motivated to combine Kidder with Vishwanath is found in Vishwanath's description of "incremental reconstruction of the output at the client" for "smart-loading which improves the user experience by providing them with some data quickly." Pet. 53–54 (citing Ex. 1005, 8:10–15). Petitioner notes that details of the output reconstruction process are lacking in Vishwanath but are found in Kidder's teaching of caching data for "iterative improvement" of data quality." *Id.* at 54 (citing Ex. 1006, 6:25–8:28), 55–56 (citing Ex. 1003 ¶¶ 239–246 (Kidder's caching technique)).

Petitioner argues a person of ordinary skill would have understood *how* to implement Kidder's storage structure and iterative transmission techniques in Vishwanath's system with a reasonable expectation of success, stemming from the significant overlap across the references in their teachings and suggested approaches for adaptive compression and transmission of data over communications channels of varying quality.

Pet. 56 (citing Ex. 1003 ¶¶ 239–247) (emphasis added).

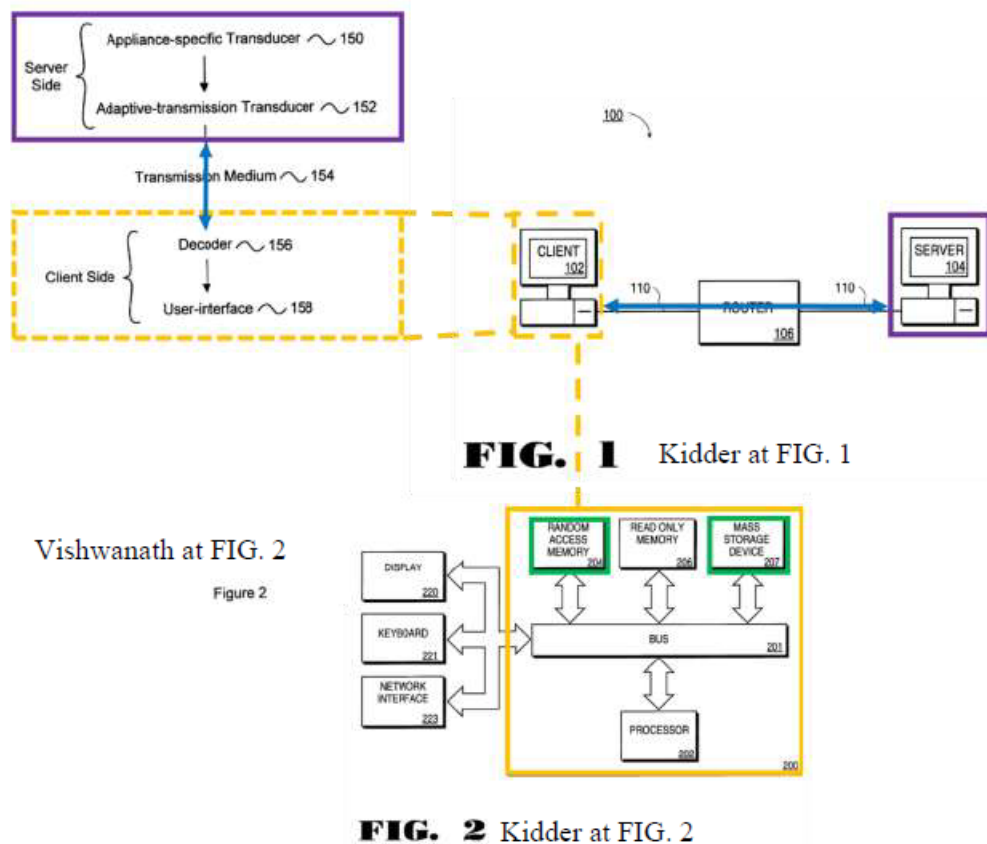
That Kidder stores different versions of the compressed data is a feature related to the "adaptive compression" taught in both references. Ex. 1003 ¶¶ 241–243 (citing Ex. 1005, 2:8–65; Ex. 1006, 6:25–8:28). Storage of decompressed data, as shown in Kidder would be an asset to data quality, i.e., "iterative improvement" using a cache. Ex. 1003 ¶ 243. Using cache memory feature is a "detail" of improving data quality not found in Vishwanath. Ex. 1003 ¶ 245.

Petitioner argues a person of ordinary skill would have understood *how* to implement Kidder's storage structure and iterative transmission techniques in Vishwanath's system with a reasonable expectation of success, stemming from

the significant overlap across the references in their teachings and suggested approaches for adaptive compression and transmission of data over communications channels of varying quality.

Pet. 56 (citing Ex. 1003 ¶¶ 239–247) (emphasis added). Petitioner uses an annotation combining Figure 2 of Vishwanath with Figures 1 and 2 of Kidder, which annotation is reproduced below. *Id.* at 57.

Petitioner's Annotation of Vishwanath Fig. 2 and Kidder Figs. 1 and 2



Id. The above annotation shows how a person of ordinary skill would “have implemented Kidder’s storage and adaptive compression system, as shown in Kidder’s FIGS. 1 and 2, in Vishwanath’s system by modifying Vishwanath’s client to cache requested data that was received and

decompressed (like Kidder’s client 102).” *Id.* at 56–57. Petitioner alleges “[i]mplementing these modifications would require only routine knowledge of electronics hardware design and conventional programming proficiency, which were well within the skill of a [a person of ordinary skill] prior to the Critical Date.” *Id.* (citing Ex. 1003 ¶ 250).

The Reader Declaration includes testimony supporting the arguments described above. *See* Ex. 1003 ¶¶ 241–246. Kidder “supplies details” of an iterative process, i.e., receiving compressed data, decompressing the data, and storing the decompressed data in cache memory. *Id.* ¶ 245 (citing Ex. 1006, 6:25–8:28). Dr. Reader testifies that

[b]ecause Kidder describes a method for decompressing and caching different versions of requested data to iteratively improve data quality [(Ex. 1006, 6:25–8:28)], one of ordinary skill would have been motivated to modify Vishwanath’s adaptive transmission system to also store decompressed data [by employing Kidder’s caching technique].

Id. ¶ 246.

Petitioner argues Vishwanath and Kidder are related art. According to Petitioner, “Vishwanath describes an adaptive compression and transmission system that selects an appropriate compression algorithm based on a parameter of requested multimedia (e.g., audio and/or video) content and available bandwidth of a transmission medium over which the multimedia content is delivered.” Pet. 53 (citing Ex. 1005, 2:8–65; Ex. 1003 ¶¶ 239–251). Petitioner argues Kidder is like Vishwanath in describing “a system that adaptively compresses data based on the ‘available bandwidth of [a] network’ over which the data is transmitted.” *Id.* (citing Ex. 1006, 6:25–8:28). Petitioner argues both references also describe compression and transmission systems that “incrementally improve data by transmitting

different versions of requested data to the same client.” *Id.* (citing Ex. 1005, code (57), 7:61–8:23; Ex. 1006, 6:25–8:28).

Patent Owner argues Petitioner has not shown “*why*” Vishwanath would have been modified by Kidder. *See* PO Resp. 34 (citing Ex. 2001 ¶¶ 88–108). Patent Owner argues that Petitioner’s alleged motivation for the combination, that “[s]torage shown in Kidder would be an asset to speed, i.e., using a cache’ and ‘[u]sing [a] cache memory feature is a ‘detail’ of improving data quality not found in Vishwanath,” and functions differently from Vishwanath. *Id.* at 35–36 (citing Ex. 1003 ¶¶ 245–246). Patent Owner contends Kidder’s cache memory “involve[s] the storage and delivery of a ‘scalable bitstream.”” *Id.* (citing Ex. 1006, 6:1–5; Ex. 2002, 83:5–98:13; Ex. 2001 ¶¶ 90–92).

Patent Owner asserts the scalable bitstream is compressed “only once . . . to generate a single video bitstream . . . that in total represents the highest possible quality video available.” PO Resp. 36–37 (citing Ex. 2002, 135:20–136:5; Ex. 2001 ¶ 92); *see id.* at 38 (that the bitstream compressed only once saves bandwidth) (citing Ex. 2001 ¶¶ 94–95; Ex. 1006, 7:45–49, 10:29–35). According to Patent Owner, decompression of the bitstream requires storing subsequent bitstreams to obtain higher quality video. *Id.* (citing Ex. 2001 ¶ 95; Ex. 1006, 10:29–35 (different versions of the video are sent to iteratively improve each version to achieve quality of original uncompressed signal)).

Patent Owner states the scalable bitstream technology of Kidder is not the predominant model for Internet video streaming. PO Resp. 38–41. Among the reasons alleged for not adopting scalable bitstream technology include the need for multiple encodings, technical complexity, cost, the

introduction of H.264–SVC (“Scalable Video Codec”), and limitations of one bitstream over two independent bitstreams. *Id.* at 39–40 (citing Ex. 2001 ¶¶ 96–98; Ex.2002, 92:22–93:13, 96:22–97:5). Patent Owner’s conclusion is that a person of ordinary skill would find scalable bitstream technology was undesirable, “and, importantly, ***did not require storage*** of partial bitstreams in the local memory of users’ devices before the user could view the highest possible quality video given bandwidth constraints.” *Id.* at 40–41 (citing Ex. 2001 ¶ 99; Ex. 2002, 100:6–13).

Patent Owner contrasts Vishwanath, which does not use a single scalable bitstream, to Kidder. PO Resp. 41. Patent Owner argues Vishwanath “does not require persistent local storage.” *Id.* (citing Ex. 1005, 3:3–6 (“server can adapt the applications accordingly” to “different media, such as wired and wireless, digital and analog”); Ex. 2001 ¶ 100). Patent Owner alleges Vishwanath tailors the encoded video data using its “adaptive-transmission encoder 152.” *Id.* at 41–42 (citing Ex. 1005, 2:33–37; Ex. 2001 ¶ 101). According to Patent Owner, Vishwanath does not combine iterations of transmitted video files. *Id.* at 42 (citing Ex. 2001 ¶ 102). Furthermore, Patent Owner contends a person of ordinary skill would not combine Kidder’s “undesirable, costly, and cumbersome” technology with the non-scalable streaming approach of Vishwanath. *Id.* at 42–43 (citing Ex. 2001 ¶ 103).¹⁸

Patent Owner’s arguments are not persuasive, because, as described above, we find on this record that Vishwanath and Kidder are sufficiently

¹⁸ We need not analyze Patent Owner’s contention that Kidder does not “expressly disclose selecting a compression algorithm based on throughput or bandwidth.” PO Resp. 44 (citing Ex. 2001 ¶ 108). As already analyzed, Petitioner relies on Vishwanath for limitation 1.2.

related that one of ordinary skill would have consulted Kidder when looking to improve the speed and data quality of Vishwanath. For example, both references teach use of “H.263 or MPEG” compression algorithms.

Ex. 1003 ¶ 248 (citing 1005, 6:62–70; Ex. 1006, 6:48–50). As shown in part by the annotation of Figure 2 of Vishwanath and Figures 1 and 2 of Kidder above, a person of ordinary skill would have had a reasonable expectation of success in combining Kidder with Vishwanath. We find the annotation persuasive, as we did in the Institution Decision. *See* Inst. Dec. 38.

We are not persuaded that the differences between Vishwanath and Kidder overcome the similarities between the two that would suggest the combination. We credit the Reader Reply Declaration regarding Kidder that “the data is encoded at least once for each iteration, or layer of scalability,” not “only” once. Reply 32 (citing Ex. 1029 ¶ 64). We also agree that whether the Kidder technology has not been widely adopted is irrelevant. *See id.* Kidder is prior art and its teachings would have been before a person of ordinary skill. *See Beckman Instruments, Inc. v. LKB Produkter AB*, 892 F.2d 1547, 1551 (Fed. Cir. 1989) (reference is “prior art for all it teaches”).

Based on the entire record, we find Petitioner has shown persuasively that a person of ordinary skill would have motivation to combine Vishwanath and Kidder and have a reasonable expectation of success in doing so. We find Petitioner has shown persuasively that Kidder teaches storing compressed data blocks, as recited in limitation 1.3.

We find that Petitioner has shown that the subject matter of claim 1 would have been obvious over Vishwanath and Kidder.

4. *Claim 7*

Claim 7 recites “wherein the at least the portion of the compressed data block was compressed, prior to decompression, based upon a user command.” Petitioner argues Vishwanath allows a user to enter a user preference after which “the system adaptively compresses the data and ‘deliver[s] it to’ the user’s client device through a transmission medium.” Pet. 79 (citing Ex. 1005, 2:22–42, 4:12–38). Relying in part on the Reader Declaration, Petitioner asserts the “user’s preference initiating the adaptive compression process renders obvious use of a user command, and that the compressed data block was compressed, prior to decompression at the client, based upon this user command.” *Id.* (citing Ex. 1003 ¶ 318).

Patent Owner argues claim 7 is patentable for the reasons argued in connection with claim 1 but does not otherwise dispute Petitioner’s argument and supporting evidence that the combination of Vishwanath and Kidder teaches claim 7. PO Resp. 44. Based on the record before us, we find Petitioner has shown persuasively that the combination of Vishwanath and Kidder teaches a user command for compressing data prior to decompressing that data, as recited in claim 7.

5. *Claim 2*

Claim 2 recites “wherein at least one of the plurality of compression algorithms is asymmetric.” Petitioner acknowledges that “neither Vishwanath nor Kidder uses the word ‘asymmetric,’ a [person of ordinary skill] reviewing Vishwanath or Kidder would have understood or found obvious the asymmetric nature of these compression algorithms.” Pet. 70 (citing Ex. 1005, 6:62–67, Fig. 7; Ex. 1006, 6:48–60 (“H.263 or MPEG”); Ex. 1003 ¶¶ 252–287). Relying in part on the Reader Declaration, Petitioner

asserts MPEG and H.263 were known asymmetric techniques. *Id.* at 70–71 (citing Ex. 1003 ¶¶ 68–87, 287).

Patent Owner argues claim 7 is patentable for the reasons argued in connection with claim 1 but does not otherwise dispute Petitioner’s argument and supporting evidence that both Vishwanath and Kidder teaches claim 2. PO Resp. 44. Based on the entire record, we find Petitioner has shown persuasively that the combination of Vishwanath and Kidder teaches claim 2.

6. Claim 8

Petitioner relies on much of its argument for claim 1 in asserting claim 8 is unpatentable. Pet. 80–83. Exemplary is limitation 8.1, which recites “a data decompression system configured to decompress a compressed data block.” Limitation 1.1, which recites, in principal part, “decompressing at least a portion of a compressed data block.” Petitioner incorporates its arguments for limitation 1.1 to show limitation 8.1. *Id.* at 80 (“See Ground 2 [1.1] incorporated here.”). Similarly, Petitioner’s argument for limitations 8.2 and 8.3 incorporate the argument for limitations 1.3 and 1.2, respectively. *Id.* at 81–83.

Limitation 8.4 recites the same language as used in dependent claim 2, analyzed above. Petitioner relies on the argument made for claim 2 for limitation 8.4. Pet. 83 (citing Ex. 1003 ¶¶ 284–292, 336–337).

Patent Owner disputes Petitioner’s argument and supporting evidence that Vishwanath and Kidder teach independent claim 8 for the same reasons it argued with respect to limitation 1.2, which we find unpersuasive. PO Resp. 45. Based on the entire record, we find Petitioner has shown

persuasively that the combination of Vishwanath and Kidder teaches claim 8.

7. Dependent Claims 3–6 and 9–15

We have reviewed Petitioner’s arguments regarding dependent claim 3–6 and 9–15. *See* Pet. 71–78 (claims 3–6), 83–87 (claims 9–15); Ex. 1003 ¶¶ 293–316 (claims 3–6), 338–350 (claims 9–15).

Patent Owner disputes Petitioner’s argument and supporting evidence that the combination of Vishwanath and Kidder teaches claims 3–6, which depend from claim 1, and 9–15, which depend from claim 8, for the same reasons it argued with respect to claims 1 and 8, which we find unpersuasive. PO Resp. 44–45. Based on the entire record, we find Petitioner has shown persuasively that the combination of Vishwanath and Kidder teaches dependent claim 3–6 and 9–15.

8. Summary (Ground 2)

Petitioner has shown by a preponderance of the evidence that claims 1–15 would have been obvious over the combination of Vishwanath and Kidder.

IV. CONCLUSION¹⁹

Petitioner has shown by a preponderance of the evidence that claims 1–15 of the ’442 patent would have been unpatentable as anticipated

¹⁹ 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

and obvious over Tso. Among other findings, we specifically find Tso discloses or teaches selecting a compression algorithm from a plurality of compression algorithms.

Petitioner has shown by a preponderance of the evidence that claims 1–15 of the '442 patent would have been unpatentable as obvious over the combination of Vishwanath and Kidder. Among other findings, we specifically find that Vishwanath's "bandwidth" is the recited "throughput."

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–15	102	Tso	1–15	
1–15	103	Tso	1–15	
1–15	103	Vishwanath, Kidder	1–15	
Overall Outcome			1–15	

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–15 of the '442 patent are determined to be unpatentable; and

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

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).

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