

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TERADATA OPERATIONS, INC.,
Petitioner,

v.

REALTIME DATA LLC,
Patent Owner.

Case IPR2017-00557
Patent 7,358,867 B2

Before GREGG I. ANDERSON, CHARLES J. BOUDREAU, and
JASON J. CHUNG, *Administrative Patent Judges*.

ANDERSON, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(A) AND 37 C.F.R. § 42.73

I. INTRODUCTION

Teradata Operations, Inc. (“Petitioner”) filed a Petition (Paper 1 (“Pet.”)) pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of claims 16–19, 32, 34, and 35 (“the challenged claims”) of U.S. Patent No. 7,358,867 B2¹ (“the ’867 patent,” Ex. 1001). Pet. 2. The Petition was supported by the Declaration of Charles D. Creusere, Ph.D. (“Creusere Declaration,” Ex. 1002). Realtime Data LLC (“Patent Owner”) filed a Preliminary Response (“Prelim. Resp.,” Paper 10). We instituted an *inter partes* review of the challenged claims (“Institution Decision” or “Inst. Dec.,” Paper 14). We issued an Institution Correction Order in which we instituted on additional grounds asserted in the Petition but not instituted in the Institution Decision (“Inst. Cor. Order,” Paper 29). *See SAS Inst., Inc. v. Iancu*, 2018 WL 1914661, at *10 (Apr. 24, 2018) (“SAS”).

Patent Owner filed a Response (“PO Resp.,” Paper 19), and Petitioner filed a Reply (“Pet. Reply,” Paper 21). Patent Owner’s Response is supported by the Declaration of Kenneth A. Zeger, Ph.D. (“Zeger Declaration,” Ex. 2003). Dr. Creusere was deposed by Patent Owner. (“Creusere Deposition,” Ex. 2002). Dr. Zeger was deposed by Petitioner (“Zeger Deposition,” Ex. 1033). An oral hearing was held on February 20, 2018, and a transcript thereof has been entered into the record (“Tr.,” Paper 28).

Subsequent to the hearing and pursuant to our Order (Paper 25), both parties submitted additional briefing pertaining to whether *Ex Parte*

¹ The ’867 Patent issued on an application filed on April 8, 2006. Ex. 1001, 22. The earliest claimed priority date for the ’867 patent is December 11, 1998. Pet. 9 (citing Ex. 1001 (63)).

Schulhauser, 2016 WL 6277792, No. 2013-007847 (PTAB 2016) (precedential) (“*Schulhauser*”) applies to conditional limitations recited in independent method claim 16 of the ’867 patent. Paper 26 (Patent Owner), Paper 27 (Petitioner). Subsequent to our Institution Correction Order, we authorized additional briefing on the additional grounds added by the Institution Correction Order, specifically stating that *Schulhauser* should be addressed as it relates to the additional grounds. Paper 30, 4. Patent Owner filed a Supplemental Brief (“Supp. Br.,” Paper 32), and Petitioner filed a Reply to the Supplemental Brief of Patent Owner (Paper 33).

The Board has jurisdiction under 35 U.S.C. § 6. This Final Written Decision issues pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 16–19, 32, 34, and 35 are unpatentable.

II. BACKGROUND

A. *Related Proceedings*

Petitioner advises us that the ’867 patent has been asserted against Petitioner in the United States District Court for the Central District of California in civil action No. 2:16-cv-02743. Pet. 1 (citing Exs. 1013, 1014). Patent Owner advises us that the ’867 patent has been asserted in six cases filed in the United States District Court for the Eastern District of Texas. Paper 9, 4. Patent Owner also advises that thirty-one *inter partes* review petitions have been filed against a total of eleven patents owned by Patent Owner, including this proceeding. *Id.* at 1.

B. Background Technology and the '867 Patent (Ex. 1001)

The '867 patent relates generally to data compression and decompression systems, including content independent and content dependent systems. Ex. 1001, 1:22–26.

1. '867 Patent Description of Technical Background

Digital data has several advantages in the representation of information like speech, music, audio, images and video that appears naturally in analog form. Ex. 1001, 1:34–46. For example, “digital data is more readily processed, stored, and transmitted due to its inherently high noise immunity.” *Id.* at 1:46–48. “Data compression is widely used to reduce the amount of data required to process, transmit, or store a given quantity of information.” *Id.* at 1:58–60.

Data compression may be lossy or lossless. Ex. 1001, 1:60–63. Lossy data compression techniques provide for “an inexact representation of the original uncompressed data” that “differs from the original unencoded/uncompressed data.” *Id.* at 1:64–67. Lossless data compression techniques provide “an exact representation of the original uncompressed data” that reproduces identically the original unencoded/uncompressed data. *Id.* at 2:12–16.

Lossless compression has associated problems dependent on factors like “compression ratio, encoding and decoding processing requirements, encoding and decoding time delays, compatibility with existing standards, and implementation complexity and cost, along with the adaptability and robustness to variations in input data.” Ex. 1001, 2:20–49. “A direct relationship exists in the current art between compression ratio and the amount and complexity of processing required.” *Id.* at 2:49–51.

Existing methods for dealing with the above-described issues include content dependent techniques where file type descriptors “describe the application programs that normally act upon the data contained within the file” so that “data types, data structures, and formats within a given file may be ascertained.” Ex. 1001, 2:59–66. This method has limitations including inability to act on application programs “which do not possess published or documented file formats, data structures, or data type descriptors.” *Id.* at 3:1–3.

Another technique includes a pre-compression phase where a data stream is accepted and the data type identified. Ex. 1001, 3:11–23. Then a data compression method is selected for compression “with the intention of producing the best available compression ratio for that particular data type.” *Id.* at 3:24–28. The limitations of this method include “the need to unambiguously identify various data types” including common data types like ASCII, binary, or Unicode. *Id.* at 3:30–32. However, there are data types that fall outside these three most common data types. *Id.* at 3:32–34.

2. The '867 Patent's Disclosure

The '867 patent seeks to address the limitations of “conventional data compression techniques as described above.” Ex. 1001, 3:45–47; *see* Section I.B.1 above. Accordingly, the '867 patent describes “systems and methods for providing fast and efficient data compression using a combination of content independent data compression and content dependent data compression.” Ex. 1001, 3:53–54. Whatever the content received by the compression system, “the system processes the input data stream in data blocks that may range in size from individual bits through complete files or collections of multiple files.” *Id.* at 6:56–59.

An encoder module receives the data blocks from an input data buffer and uses different encoding techniques based on the various types of input data. Ex. 1001, 6:6–17, Fig. 2. Data compression is performed by encoder module 30, “wherein each of the encoders . . . processes a given input data block and outputs a corresponding set of encoded data blocks.” *Id.* at 7:20–23.

In one embodiment, a compression ratio is obtained for each of the encoders and then compared with a first compression threshold. Ex. 1001, 8:22–27. A determination is made as to whether or not the threshold is exceeded. *Id.* at 8:26–27, 38–41. “If there are no encoded data blocks having a compression ratio that exceeds the compression ratio threshold limit,” a negative determination in step 316 of Figure 3, then “the original unencoded input data block is selected for output and a null data compression type descriptor is appended thereto (step 318).” *Id.* at 8:41–52. “A null data compression type descriptor is defined as any recognizable data token or descriptor that indicates no data encoding has been applied to the input data block.” *Id.* The “unencoded input data block with its corresponding null data compression type descriptor is then output for subsequent data processing, storage, or transmittal (step 320).” *Id.*

If a positive determination is made at step 316 and the “blocks possess a compression ratio greater than the compression ratio threshold limit,” “then the encoded data block having the greatest compression ratio is selected,” and “[a]n appropriate data compression type descriptor is then appended.” Ex. 1001, 8:53–58. “A data compression type descriptor is defined as any recognizable data token or descriptor that indicates which data encoding technique has been applied to the data.” *Id.* at 8:58–61. “The

encoded data block having the greatest compression ratio along with its corresponding data compression type descriptor is then output for subsequent data processing, storage, or transmittal.” *Id.* at 8:66–9:3.

C. Illustrative Claim

Of the challenged claims, method claim 16 is the only independent claim. Claims 17, 32, 34, and 35 depend from claim 16, and claims 18 and 19 depend from claim 17. Claim 16 is reproduced below.

- 16[A]² A method comprising: receiving a plurality of data blocks;
- 16[B] determining whether or not to compress each one of said plurality of data blocks with a particular one or more of several encoders;
- 16[C1] if said determination is to compress with said particular one or more of said several encoders for a particular one of said plurality of data blocks;
- 16[C2] compressing said particular one of said plurality of data blocks with said particular one or more of said several encoders to provide a compressed data block;
- 16[C3] providing a data compression type descriptor representative of said particular one or more of said several encoders;

² Petitioner identifies limitations with the claim number and a letter in brackets, e.g., “16[A]” for the first limitation of claim 16. Pet. 16. Patent Owner adopts the same nomenclature but further breaks down some limitations, e.g., “16[C1]” for the first part of the limitation identified by Petitioner as limitation “16[C]” and “16[C2]” for the second part of the limitation. PO Resp. 7. We adopt Petitioner’s nomenclature as modified by Patent Owner for purposes of this Decision.

- 16[C4] outputting said data compression type descriptor and said compressed data block;
- 16[D1] if said determination is to not compress said particular one of said plurality of data blocks;
- 16[D2] providing a null data compression type descriptor representative of said determination not to compress; and
- 16[D3] outputting said null data compression type descriptor and said particular one of said plurality of data blocks.

Ex. 1001, 28:9–30.

D. References

Petitioner relies on the following references:

1. W.H. Hsu, *et al.*, *Automatic Synthesis of Compression Techniques for Heterogeneous Files*, 25(10) Software Practice & Experience 1097–1116 (1995) (“Hsu,” Ex. 1005).
2. U.S. Patent No. 5,870,036 to Franaszek et al., issued February 9, 1999 (“Franaszek,” Ex. 1006).
3. U.S. Patent No. 5,097,261 to Langdon, Jr. et al, issued March 17, 1992 (“Langdon, Jr.,” Ex. 1007).

The Petition also relies on the Creusere Declaration to support the various contentions.

E. Grounds upon Which Trial Was Instituted

Trial was instituted on the following grounds:

1. Claims 16, 32, 34, and 35 as anticipated under section 102³ by Hsu.

³ The Leahy-Smith America Invents Act (AIA), Pub. L. No. 112-29, 125 Stat. 284, 285–88 (2011), which revised 35 U.S.C. §§ 102 and 103, became effective March 16, 2013. The ’867 patent has an effective filing date of December 11, 1998, prior to the effective date of the AIA. Pet. 9 (citing

2. Claims 17 and 18 as obvious under section 103 over Hsu.
3. Claims 16–19, 32, 34, and 35 as anticipated under section 102 by Franaszek.
4. Claims 16–19, 32, 34, and 35 as obvious under section 103 over Franaszek.
5. Claims 17, 18, and 32 as obvious under section 103 over Hsu in view of Franaszek.
6. Claim 19 as obvious under section 103 over Hsu in view of Langdon, Jr.
7. Claim 19 as obvious under section 103 over Hsu in view of Franaszek and Langdon, Jr.
8. Claims 16–19, 32, 34, and 35 as obvious under section 103 over Franaszek and Langdon, Jr.
9. Claims 16–19, 32, 34, and 35 as obvious under section 103 over Franaszek in view of Hsu.
10. Claim 19 as obvious under section 103 over Franaszek, Hsu, and Langdon, Jr.

Inst. Dec. 38–39, Inst. Cor. Order 2–3.

III. ANALYSIS

A. Claim Construction

In *inter partes* review, claim terms are given their broadest reasonable interpretation in light of the specification in which they appear. *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016); 37 C.F.R. § 42.100(b). We presume that claim terms have their ordinary and

Ex. 1001 (63)). Thus, the grounds asserted are under the pre-AIA version of §§ 102 and 103.

customary meaning. *See Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1061–62 (Fed. Cir. 2016) (“Under a broadest reasonable interpretation, words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification and prosecution history.” (citation omitted)); *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In the absence of such a special definition or other consideration, “limitations are not to be read into the claims from the specification.” *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Only those terms that are in controversy need to be construed 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) (citing *Vivid Techs. Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). Petitioner proposes two terms for construction, which we construed in the Institution Decision, repeating those constructions at Sections III.A.2 and 3 below. *See* Inst. Dec. 10–11. Patent Owner does not propose any term for construction, arguing construction is “unnecessary to resolve the controversy.” PO Resp. 6.

For continuity of the record, we repeat our constructions from the Institution Decision below at sections III.A.1 through 3. At the oral hearing, for the first time, we raised a question about the application of *Schulhauser* to the conditional limitation 16[B], “whether or not to compress . . . with a

particular one or more of several encoders.” Tr. 22:20–26:2. The construction of limitation 16[B] is discussed in Section III.A.4 below.

1. “each one” or “particular one” (claim 16)

In the Institution Decision, we construed “each one” or “particular one.” Inst. Dec. 7–10. We determined that no construction beyond the plain meaning of the claim was required and that a “data block” may be made up of multiple “data blocks.” *Id.* at 10.

In its Preliminary Response, Patent Owner argued limitations of claim 16 should be construed to require “block-by-block” compression not disclosed in Hsu. Prelim. Resp. 18–29. Patent Owner contended Hsu “describes a different approach that groups multiple data blocks together and outputs a compression history only once it has compressed an entire file.” *Id.* at 19. Focusing on the claim language “each one” and “particular one” in limitations 16[C1–C4] and 16[D1–D3], Patent Owner’s argument was based, in principal part, on reading claim 16 as a whole to mean “block-by-block.” *See id.* at 21–22.

In its Response, Patent Owner does not restate its “block-by-block” argument. Neither does Patent Owner challenge our interpretation of “each one” or “particular one.” Patent Owner does argue that Hsu has not been shown to disclose “[c]laim 16’s limitations [that] repeatedly recite ‘data blocks.’” PO Resp. 7. We address the “data block” argument in the Response later in this Decision (*see* Section III.B.1.b(3)(a) below) but remain unpersuaded by the “block-by-block” argument. In any event, Patent Owner has waived this specific argument.⁴ Further, because the argument is

⁴ *See* Scheduling Order, 3, Section 2.a, Paper 15 (“**The patent owner is cautioned that any arguments for patentability not raised in the**

not repeated in the Response, the construction of “each one” or “particular one” is no longer disputed. Thus, we maintain our determination from the Institution Decision that no construction beyond the claim language is required and that a “data block” may be made up of multiple “data blocks.” Inst. Dec. 10.

2. “*a data compression type descriptor*” (claims 16 & 17)

Petitioner identifies two terms for construction, “a data compression type descriptor” and “a null data compression type descriptor.” Pet. 16. Patent Owner asserts that the terms are irrelevant to the contested issues. PO Resp. 5–6. Patent Owner argues the terms construed are not in dispute and its “Response assumes *arguendo* that Petitioner’s proposed constructions are correct.” *Id.* at 6 (citing, *inter alia*, *Vivid Techs.*, 200 F.3d at 803).

“A data compression type descriptor is defined as any recognizable data token or descriptor that indicates which data encoding technique has been applied to the data.” Ex. 1001, 8:58–61. This definition from the Specification is stated clearly and with precision, proposed by Petitioner, not objected to by Patent Owner, and adopted herein. *See* Pet. 16; *see also In re Paulsen*, 30 F.3d at 1480 (definitions in the Specification are followed if stated with “reasonable clarity, deliberateness, and precision”).

3. “*a null data compression type descriptor*” (claims 16 & 17)

“A null data compression type descriptor is defined as any recognizable data token or descriptor that indicates no data encoding has been applied to the input data block.” Ex. 1001, 8:46–49. As with “a data

response may be deemed waived.”).

compression type descriptor,” this definition comes from the Specification and is adopted herein. See Pet. 16.

4. “*whether or not to compress . . . with a particular one or more of several encoders*” (claims 16 & 17)

Limitation 16[B] recites a condition, i.e., “whether or not to compress.” Limitation 16[B] is followed by two alternatives, limitations 16[C] and 16[D]. Limitation 16[C] applies “*if said determination is to compress.*” Limitation 16[D] applies “*if said determination is to not compress.*” Our precedential decision in *Schulhauser* holds that only one of two mutually exclusive method claim limitations, here 16[C] or 16[D], need be disclosed in order to meet a conditional limitation such as 16[B]. *Schulhauser* at 8–9. Per our order (Paper 25), both parties briefed the applicability of *Schulhauser* after the oral hearing. Papers 26 (Patent Owner), 27 (Petitioner).

a. *Does Schulhauser Apply to the Present Case*

Petitioner argues that *Schulhauser* applies and that it argued the holding of that case by asserting only one limitation need be shown in its Reply. Paper, 27, 3. Patent Owner argues that *Schulhauser* does not support unpatentability in this case and submits five reasons it should not apply here. Paper 26, 1. Patent Owner argues, as an initial matter, that Petitioner did not present timely any argument or theory based on *Schulhauser* and that it has waived the ability to present these arguments. Patent Owner argues the Board is foreclosed legally from now finding unpatentability based on *Schulhauser sua sponte*. Paper 26, 1–2 (citing *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016); *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016); *Wasica*

Finance GMBH v. Cont'l Auto. Sys., 853 F.3d 1272, 1286 (Fed. Cir. 2017); *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367 (Fed. Cir. 2015); 35 U.S.C. § 554(b)(3); 77 Fed. Reg. 48,756, 48,768; 37 C.F.R. § 42.23(b). Patent Owner further argues *Schulhauser*'s precedential designation pre-dates the Petition, but the Petition did not raise this issue. *Id.* at 2. Moreover, Patent Owner argues it did not have a full and fair opportunity to develop responsive evidence or argument. *Id.*

Additionally, Patent Owner argues applying *Schulhauser* in the context of this proceeding would be arbitrary, capricious, and unconstitutional. *Id.* Patent Owner explains the *Schulhauser* decision arose in the context of a pending prosecution. *Id.* Patent Owner argues, in that setting, a patentee can address *Schulhauser* by simply amending claims to avoid limitations that will not be given patentable weight. *Id.*

Furthermore, Patent Owner argues during prosecution it had no notice from the Office of *Schulhauser* or the prospect that certain limitations of its claims would be given no patentable weight. *Id.* Patent Owner argues that the Notice of Allowance stated the claim limitations at issue, limitations 16[D1], 16[D2], and 16[D3], were not taught by the prior art. *Id.* (citing Ex. 1004, 660). Patent Owner argues it maintained the limitations on that basis, and made significant investments and expenditures to enforce and defend the claims. *Id.* According to Patent Owner, the Office must undertake notice and comment rulemaking to apply the rule of *Schulhauser* to IPRs, and the Office has not issued any rule, regulation, or policy complying with the requirements of the Administrative Procedure Act (hereinafter, "APA") that extends *Schulhauser* to issued claims later challenged through *inter partes* review. *Id.* at 2–3 (citing *Aqua Prods. v.*

Matal, 872 F.3d 1290, 1319–1322, 1328 (Fed. Cir. 2017) (*en banc*)).

Patent Owner argues *Schulhauser* is directed to prosecution entirely, rather than *inter partes* review. Paper 26, 3. Patent Owner also argues there is no express Congressional grant to support such retroactive rulemaking, and it is thus foreclosed by the APA and United States Supreme Court precedent. *Id.* (citing *Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 208–09 (1988)). In addition, Patent Owner argues that applying *Schulhauser* in this case would “violate the Due Process Clause.” PO Br. 3. Patent Owner argues *Schulhauser* only arose here after the time to bring a motion to amend had passed. *Id.* Patent Owner argues depriving the conditional limitations of the patentable weight that was previously afforded would constitute an unlawful taking. *Id.*

Patent Owner also argues *Schulhauser* rests entirely on two non-precedential Federal Circuit decisions that do not support its holding, and it is legally incorrect. Patent Owner argues that the Board should, instead, direct its attention to *Applera v. Illumina*, 375 F. App’x 12, 21 (Fed. Cir. 2010). Paper 26, 3–4. Patent Owner argues *Applera* held that all limitations were practiced, not that the claim could be met even if some limitations were never practiced. *Id.* at 4. Patent Owner also argues *Schulhauser*’s quotes from in *Cybersettle v. National Arbitration Forum*, 243 F.App’x 603, 607 (Fed. Cir. 2007), are misplaced. *Id.* at 4. Patent Owner argues the broadest reasonable interpretation under Federal Circuit standards prohibits a construction that reads out limitations explicitly recited in a claim, or that causes the claim to read onto prior art approaches expressly taught away from in the specification. *Id.* (citing *In re Suitco Surface*, 603 F.3d 1255, 1260–61 (Fed. Cir. 2010); *In re Smith*, 871 F.3d 1375, 1382–84 (Fed. Cir.

2017); *In re NTP, Inc.*, 654 F.3d 1279, 1287–88 (Fed. Cir. 2011)).

As an initial matter, as discussed further below, we follow *Schulhauser* because it is precedential. The Board’s Standard Operating Procedures (“SOP”) require it to follow its precedential decisions. PTAB SOP No. 2, Rev. 9, 3 (Sept. 22, 2014) (“A precedential opinion is binding authority in subsequent matters involving similar facts or issues.”). Even though Petitioner did not raise the *Schulhauser* issue in its Petition, we conclude the best course of action under these specific circumstances is to follow the Board’s SOP and our precedent in *Schulhauser*. To address APA concerns, due process concerns, the sufficiency of notice and potential prejudice, we allowed the parties the additional opportunity to brief the issue.⁵ Paper 25, 1–2. In summary, *Schulhauser* is our precedent and it should apply given its applicability to the claim construction for the claims at issue.

Petitioner did not waive the conditional limitation argument. Although Petitioner did not cite *Schulhauser* in its Petition or Reply, it did argue that it needed only show one of the conditions in its Reply. Pet. Reply 16–17 (arguing claim 16 only requires “*either* a determination to compress or a determination not to compress.” (emphasis added)). This argument was a proper reply to Patent Owner’s argument that a “particular encoder” is not

⁵ Patent Owner did not identify any Federal Circuit cases that overruled *Schulhauser*. See PO Br. 3–5. Petitioner cited a related Board case. Pet. Br. 3–4 (citing *Reactive Surfaces Ltd. v. Toyota Motor Corp.*, Paper 60 (PTAB Jan. 12, 2018)). In *Reactive*, based on the Board’s SOP, the Board authorized additional briefing in a *sua sponte* post-hearing order to resolve whether *Schulhauser* applies to the conditional method limitations recited in the claims. *Reactive*, Paper 60. We agree with the way in which the panel handled the *Schulhauser* issue in *Reactive* and followed that procedure here.

used if the determination is not to compress. PO Resp. 17 (limitation 16[B] “would not be satisfied by *a general determination not to compress a data block* at all that is made independently of any particular encoder.” (emphasis added)).

Patent Owner’s argument that *Schulhauser* arose in the context of prosecution such that a patentee can work around *Schulhauser* by simply amending claims to avoid limitations that will not be given patentable weight is unpersuasive. To the extent that Patent Owner is arguing that we can apply *Schulhauser* only to patent prosecution matters and cannot apply *Schulhauser* to an *inter partes* review, we disagree. First, the opinion in *Schulhauser* did not limit, explicitly or implicitly, its holding only to prosecution. *See generally Schulhauser*. Second, other panels have applied *Schulhauser* in the same situation. *See Reactive, supra*.

We note Patent Owner’s statement that in the present case, *Schulhauser* only arose after the time to bring a motion to amend had passed. Paper 26, 2–3. Patent Owner argues *Schulhauser* was not an issue in the case until after the deadline for filing a motion to amend under our Scheduling Order (Paper 15). *Id.* at 3. This argument is not persuasive because at no time has Patent Owner asked for leave to file a motion to amend.⁶ Absent being presented with an amended claim, or even a

⁶ The motion to amend due date is not a statutory deadline; as a result, it can be adjusted by the panel. *See* 37 C.F.R. § 42.5 (a) (“The Board may determine a proper course of conduct in a proceeding for any situation not specifically covered by this part and may enter non-final orders to administer the proceeding.”).

suggestion that one could be presented, the argument lacks relevance.

Patent Owner's arguments based on the evidence are addressed in our substantive analysis of anticipation by Hsu or Franaszek below.

b. Application of Schulhauser

Because we find that it is appropriate to apply *Schulhauser* to the present case for at least the reasons stated *supra* in § III.A.4.a, we construe limitation 16[B] according to the broadest reasonable construction in light of the specification (i.e., using *Schulhauser*) as explained *infra*. In *Schulhauser*, the Board held that, in the method claim 1 at issue in that case, **only one** of the following conditional limitations needed to be satisfied in the prior art to render the claim anticipated or obvious: (1) “triggering an alarm state if the electrocardiac signal data is not within the threshold electrocardiac criteria”; and (2) “determining the current activity level of the subject from the activity level data if the electrocardiac signal data is within the threshold electrocardiac criteria.” *Schulhauser* at 6–8. To paraphrase, in *Schulhauser*, illustrative method claim 1 recited if A, then perform step X; if not A, then perform step Y. *Id.*

In the same manner as the cited limitations in *Schulhauser*, limitation 16[B] in the present case recites “determining whether or not to compress each one of said plurality of data blocks.” Ex. 1001, 28:11–13. If, per limitation 16[C], “said determination is to compress,” then the claim requires “compressing,” “providing a data compression type descriptor,” and “outputting said compression type descriptor and said compressed data block.” *Id.* at 28:14–24. If, per limitation 16[D], “said determination is to not compress,” then the claim requires “providing a null data compression type descriptor” and “outputting said null data type compression type

descriptor.” *Id.* at 28:25–30. As a matter of law, we, therefore, find only one of limitations 16[C] and 16[D] needs to be satisfied in the prior art.

Patent Owner argues the broadest reasonable construction in light of the specification “teaches *against* an approach that simply determines to compress data, without ever deciding to not compress data.” Paper 26, 4 (citing Ex. 1001, 2:38–42). Patent Owner contends we “recognized the specification’s teachings on this point at institution.” *Id.* (citing Inst. Dec. 3–4).

The Institution Decision’s citation to column 2 is a discussion of the ’867 patent, no more. Column 2 of the ’867 patent explains that “[a] further problem is that negative compression may occur when certain data compression techniques act upon many types of highly compressed data.” Ex. 1001, 2:38–40. This may “substantially expand, not compress this type of data.” *Id.* at 2:40–42. The ’867 patent simply discusses one problem that may result from compressing data with some unspecified technique but “does not teach away . . . if it merely expresses a general preference for an alternative invention but does not ‘criticize, discredit, or otherwise discourage’ investigation into the invention claimed.” *See DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009).

We would reach the same conclusion without applying *Schulhauser*. That is, claim 16 is construed the same with or without *Schulhauser*. Without considering *Schulhauser*, Figure 10a illustrates an embodiment teaching a logical path through the flow chart that determines to compress or not to compress based upon a calculated compression ratio from Figure 10b. Ex. 1001, Figs. 10a–b, 13:10–14:49. “If there are no encoded data blocks having a compression ratio that exceeds the compression ratio threshold

limit (negative determination in step 128), then the original unencoded input data block is selected for output and a null data compression type descriptor is appended thereto (step 130).” *Id.* at 14:9–14. “On the other hand, if one or more of the encoded data blocks possess a compression ratio greater than the compression ratio threshold limit (affirmative result in step 128),” then “[a]n appropriate data compression type descriptor is then appended (step 138) to indicate the data encoding technique applied to the encoded data block.” *Id.* at 14:18–20, 28–31. The broadest reasonable construction in light of the specification specifically teaches that one aspect of the present invention logically includes a method that relies only on a determination *either* to compress or not to compress a particular block, and therefore, the broadest reasonable construction in light of the specification cannot be said to teach performing both.

B. Law of Anticipation

In order for a prior art reference to serve as an anticipatory reference; it must disclose every limitation of the claimed invention, either explicitly or inherently. *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997). We must analyze prior art references as a skilled artisan would. *See Scripps Clinic & Res. Found. v. Genentech, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir. 1991), *overruled on other grounds by Abbott Labs. v. Sandoz, Inc.*, 566 F.3d 1282 (Fed. Cir. 2009). As the Federal Circuit has held,

This modest flexibility in the rule that “anticipation” requires that every element of the claims appear in a single reference accommodates situations where the common knowledge of technologists is not recorded in the reference; that is, where technological facts are known to those in the field of the invention, albeit not known to judges. It is not, however, a substitute for determination of patentability in terms of § 103.

Cont'l Can Co. USA v. Monsanto Co., 948 F.2d 1264, 1268–69 (Fed. Cir. 1991).

The elements must be arranged as required by the claim, but identity of terminology is not required. *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990). Furthermore,

[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 patent is invalid as anticipated is a two-step inquiry. *See Power Mosfet Techs., LLC v. Siemens AG*, 378 F.3d 1396, 1406 (Fed. Cir. 2004). The first step requires construction of the claims. *Id.* The second step in the analysis requires a comparison of the properly construed claim to the prior art. *Id.*

1. Anticipation by Hsu (claims 16, 32, 34, and 34)

Petitioner alleges that claims 16, 32, 34, and 35 are anticipated under 35 U.S.C. § 102 by Hsu. Pet. 4, 16–25 (Ground 1). Claim 16 is the only independent claim of the '867 patent. Petitioner's supporting evidence includes the Creusere Declaration. Ex. 1002 ¶¶ 90–106, 147–149, 154–160.

As discussed below, Patent Owner argues Hsu does not disclose the claimed “data blocks.” PO Resp. 6–15. Patent Owner further argues Hsu does not disclose limitation 16[B], “determining whether or not to compress . . . with a particular one or more of several encoders.” *Id.* at 15–22. Patent Owner's supporting evidence regarding limitation 16[B] includes the Zeger Declaration. Ex. 2003 ¶¶ 22–33.

a. Hsu Overview (Ex. 1005)

Hsu describes compression techniques for “heterogeneous files, those files which contain multiple types of data such as text, images, binary, audio, or animation.” Ex. 1005, 1097 (Summary). Hsu’s “compressor” uses different algorithms depending on the different types of data. *Id.* at 1102.

Hsu uses a two-phase approach to perform the actual compression. Ex. 1005, 1102. “In the first phase, the system determines the type and compressibility of each block.” *Id.* “The second phase comprises the actual compression and an optimization that maximizes the size of a segment of data to be compressed using a particular algorithm.” *Id.*

Hsu analyzes three primary redundancy metrics to determine the compressibility of each data block. Ex. 1005, 1105–06. The three metrics are “*alphabetic distribution metric*,” “*average run length metric*,” and “*string repetition ratio metric*.” *Id.* The metric that yields the highest number of the three is considered to be the largest redundancy metric and, therefore, the most prevalent type of redundancy in the data block. *Id.* at 1106. “If at least one of the parameters is greater than 2.5, the file is considered compressible,” and the “maximum of the normalized metrics is then selected and used in conjunction with the file type to select the appropriate compression algorithm from the lookup table.” *Id.* If, however, “all the normalized metrics are smaller than 2.5, the file is considered not compressible, and the system records a verdict of ‘uncompressible’ on the current block.” *Id.*

Hsu explains for each block “[a]n identifying tag for the selected algorithm is written to the ‘compression plan’, an array which stores one complete compression instruction per block (if the current block is deemed

uncompressible, a ‘skip’ instruction is recorded).” *Id.* at 1109. “The compressed data is written to an output buffer, while the compressed length (which indicates where in the compressed file a compressed block begins and ends) and compression method are recorded in a separate history for reference at decompression time.” *Id.* “Upon reaching the end of the blocks, the system writes out the compressed data from the output buffers and prepends the encoded compression history to produce the final output file.” *Id.*

b. Claim 16

The parties’ positions are summarized below followed by our analysis. We adopt the following showing of Petitioner with respect to each referenced limitation of claim 16 as discussed below. Patent Owner makes two arguments for patentability in Sections III.B.1.b(2)(a) and (b). We address those arguments in our discussion in Sections III.B.1.b(3)(a) and (b).

(1) Petitioner’s Argument and Supporting Evidence

Limitation 16[A] recites “[a] method comprising: receiving a plurality of data blocks.” Ex. 1001, 28:9. Petitioner relies on Hsu as disclosing a method of “compressing ‘heterogeneous files’—files that contain ‘multiple types of data such as text, images, binary, audio, or animation.

Consequently, their constituent parts may have different degrees of compressibility.” Pet. 16–17 (citing Ex. 1005, 1098). Petitioner cites to Hsu’s compressor, which “treats a file as a collection of fixed size [data] blocks, each containing a potentially different type of data and thus best compressed using different algorithms.” *Id.* at 17 (internal brackets omitted (citing Ex. 1005, 1102; Ex. 1002 ¶ 91; Ex. 1005, 1097 (Summary)), 1098 (different methods for compression may give “greater savings”)). Relying

on the Creusere Declaration, Petitioner asserts a person of ordinary skill in the art “would understand that Hsu’s disclosure of heterogeneous files that are best compressed on a block-by-block basis requires ‘receiving a plurality of data blocks.’” *Id.* (citing Ex. 1002 ¶ 91).

Limitation 16[B] recites, “determining whether or not to compress each one of said plurality of data blocks with a particular one or more of several encoders.” Ex. 1001, 28:11–13. Petitioner cites the Creusere Declaration testimony regarding compression algorithms. Pet. 17–18 (citing Ex. 1005, 1098, 1103, 1107 (Table I)); Ex. 1002 ¶ 93 (opining “Hsu would have been understood by a person of ordinary skill in the art as disclosing” limitation 16[B]). Relying on the Creusere Declaration, Petitioner argues Hsu discloses to a person of ordinary skill encoders because of its description of “compression algorithm” or “algorithm,” such as “arithmetic coding, run-length encoding, Lempel-Ziv, and JPEG.” *Id.* (citing Ex. 1002 ¶ 93). Further, according to Petitioner, the algorithms are applied to different data types, including, for example, ANSI text, hexadecimal encodings of binary data, and computer source code. *Id.* (citing Ex. 1005, 1103, 1107 (Table I); Ex. 1002 ¶ 93). Based on the identification of data type, Petitioner argues that Hsu’s system applies the “appropriate compression algorithm . . . from the compression algorithm database.” *Id.* at 18 (citing Ex. 1005, 1102; Ex. 1002 ¶95).

Petitioner’s evidence regarding limitation 16[B] includes that Hsu explains that “[t]he compressibility of a block of data and the appropriate algorithm to do so are determined by the type of data contained in the block and the type of redundancy (if any) in the data” and that these properties are “represented by four parameters: the block type, and the three redundancy

metrics.” Pet. 18 (citing Ex. 1005, 1102, 1103; Ex. 1002 ¶ 95 (quoting from Hsu⁷)). Petitioner argues Hsu’s “redundancy metrics include character frequencies or alphabetic distribution (MAD), average run length (MRL), and string repetition (MSR).” *Id.* (citing Ex. 1005, p.1104–1106; Ex. 1002, ¶95). Petitioner argues Hsu’s first phase of compression determines the compressibility of each block and “applies the selected algorithms to the blocks separately.” *Id.* (quoting Ex. 1005, 1098, 1102; Ex. 1002 ¶¶ 95, 96). Specifically, a determination is made as to whether the metrics are below or above the 2.5 threshold. *Id.* at 18–19. If below 2.5, the block or file is considered fully compressed and if above 2.5 the block or file is considered compressible. *Id.* at 18–19 (citing Ex. 1005, 1102, 1106; Ex. 1002 ¶ 96).

Limitation 16[C] recites:

if said determination is to compress with said particular one or more of said several encoders for a particular one of said plurality of data blocks [C1];

compressing said particular one of said plurality of data blocks with said particular one or more of said several encoders to provide a compressed data block [C2];

providing a data compression type descriptor representative of said particular one or more of said several encoders [C3];

outputting said data compression type descriptor and said compressed data block [C4]. Ex. 1001, 28:14–19.

For the above “determination” limitation 16[C1], Petitioner points out Hsu’s system applies the “appropriate compression algorithm . . . from the

⁷ Dr. Creusere mistakenly cites Exhibit 1006 (Franaszek) rather than Exhibit 1005 (Hsu). The quote at paragraph 95 of the Creusere is directly from Hsu. The citation is a typographical error.

compression algorithm database.” Pet. 19 (citing Ex. 1002 ¶ 100; Ex. 1005, 1102). Petitioner also quotes from Hsu that “[t]he compressibility of a block of data and the appropriate algorithm to do so are determined by the type of data contained in the block and the type of redundancy (if any) in the data.” *Id.* (citing Ex. 1005, 1103; Ex. 1002 ¶ 100).

For the “compressing” limitation 16[C2], which occurs after the determination of limitation 16[C1], Petitioner relies on Hsu’s disclosure of “a heterogeneous compressor” that “automatically chooses the best compression algorithm” for a “given variable-length block of a file” and “applies the selected algorithms to the blocks separately.” Pet. 19–20 (citing Ex. 1005, 1098; Ex. 1002 ¶ 100). Petitioner asserts that Hsu discloses that compressibility and the appropriate compression algorithm are determined based on the type of data contained in the block. *Id.* (citing Ex. 1005, 1103; Ex. 1002 ¶ 100).

Relevant to the “data compression type descriptor” limitation 16[C3], Petitioner argues Hsu discloses that “[t]he compression method for the current block is then recorded in a small array-based map of the file.” Pet. 20 (citing Ex. 1005, 1102; Ex. 1002 ¶ 101). Hsu records the selected compression method and “[a]n identifying tag” is written into a “compression plan,” or if uncompressible, a “skip” instruction is recorded. Ex. 1005, 1102, 1109. Petitioner cites to the preceding disclosure and the Creusere Declaration for support that the “data compression type descriptor” is disclosed by Hsu. Pet. 20 (citing Ex. 1002 ¶ 101).

For the “outputting said data compression type descriptor” limitation 16[C4], Hsu compresses “newly merged blocks.” Ex. 1005, 1109. The algorithm used is recorded in the compression plan. *Id.* Petitioner relies on

Dr. Creusere’s citation of the preceding as disclosing the “outputting” limitation. Pet. 20–21 (citing Ex. 1002 ¶ 102). Dr. Creusere further testifies Hsu discloses that

[t]he compressed data is written to an output buffer, while the compressed length (which indicates where in the compressed file a compressed block begins and ends) and compression method are recorded in a separate history for reference at decompression time. . . . Upon reaching the end of the blocks, the system writes out the compressed data from the output buffers and prepends the encoded compression history to produce the final output file.

Ex. 1005, 1109. The immediately preceding quotation is cited by Petitioner as part of its evidence regarding the “outputting” limitation 16[C4].

Limitation 16[D] recites “if said determination is to not compress said particular one of said plurality of data blocks [D1]; providing a null data compression type descriptor representative of said determination not to compress [D2]; and outputting said null data compression type descriptor and said particular one of said plurality of data blocks [D3].” Ex. 1001, 28:25–30. In connection with the preceding “determination” limitation 16[D1], Hsu describes that whether a data block is determined to be “not compressible” is based on, for example, whether the “normalized metrics are smaller than 2.5.” Ex. 1005, 1106. As to the “null data compression type descriptor” limitation 16[D2], if the metric is smaller than 2.5 and the block under consideration is “uncompressible,” a tag in the form of a “skip” instruction is written to the compression plan. *Id.* at 1109. Petitioner relies on the preceding and the Creusere Declaration to assert limitations 16[D1–2] are disclosed. Pet. 21 (citing Ex. 1002 ¶ 104 (“[a person of ordinary skill in the art] would understand that Hsu discloses ‘providing a null data

compression type descriptor representative of said determination not to compress.’’’)).

For the outputting of the “null data compression type descriptor” limitation 16[D3], Hsu writes the compressed data to an output buffer. Ex. 1005, 1109. Hsu further discloses

the compressed length (which indicates where in the compressed file a compressed block begins and ends) and compression method are recorded in a separate history for reference at decompression time. If negative compression or no compression is achieved, or if the block was already marked uncompressible, then the data is copied directly to the output buffer (the full block length and a code for “no compression” are recorded in the compression history). Upon reaching the end of the blocks, the system writes out the compressed data from the output buffers and prepends the encoded compression history to produce the final output file.

Id. Petitioner and Dr. Creusere rely on the above disclosures as disclosing limitation 16[D3]. Pet. 21–22 (citing Ex. 1002 ¶ 105).

(2) Patent Owner’s Arguments and Supporting Evidence

Patent Owner disputes that Petitioner has shown Hsu discloses “data blocks” and “whether or not to compress . . . with a particular one or more of several encoders.” PO Resp. 6–22. Patent Owner’s arguments and supporting evidence are summarized below.

(a) Hsu Does Not Disclose “data blocks”

Patent Owner first argues “Petitioner has no evidence demonstrating that Hsu teaches the claimed ‘data blocks.’” PO Resp. 6–15. This argument applies to Grounds 1, 2, 5, and 6 set forth in Section II.E. above. *Id.* at 6, 8, 15.

Patent Owner contends that Hsu is relied on to teach the “data block” limitation for Grounds 1, 2, 5, and 6. PO Resp. 8. In connection with this argument, Patent Owner does not argue specifically any ground beyond anticipation by Hsu of claim 16 (Ground 1). Thus, for its “data blocks” argument Patent Owner points to limitations 16[A], 16[B], 16[C1], 16[C2], 16[D1], and 16[D3] as all including reference to “data blocks.” *Id.* at 7.⁸

Patent Owner argues that Petitioner does not show “how” Hsu discloses “data blocks.” PO Resp. 6 (citing *Comcast Cable Commc’ns, LLC v. Rovi Guides, Inc.*, IPR2017-00956, 2017 WL 4102214, at *6 (Sept. 15, 2017) (other citations omitted)). Absent such foundation, Patent Owner argues Petitioner’s allegations are “[c]onclusory or vague assertions.” *Id.* at 7.

Patent Owner first asserts that Petitioner and Dr. Creusere agree that claim 16 is limited to compressing and outputting on a “block-by-block” basis, i.e., one “data block” at a time. PO Resp. 8 (citing Ex. 1001, 8:11–17; Ex. 2002, 11:20–25). Patent Owner then argues that “the Petition does not explain how Hsu teaches the ‘data blocks’ of Claim 16.” *Id.* at 9. Patent Owner highlights the deposition testimony of Dr. Creusere that “***I do not say that from Hsu the things that would be analogous to the data blocks in Claim 16A in Hsu are X.***” *Id.* Patent Owner acknowledges that at his

⁸ Patent Owner does not argue expressly its contention in the Preliminary Response that claim 16 is limited to compressing and outputting on a “block-by-block” basis. Prelim. Resp. 18–29. We found that argument unpersuasive in the Institution Decision. Inst. Dec. 10, 19–21; *see also* Section III.A.1 above (determining that the plain meaning of “each one” or “particular one” did not preclude a “data block” made up of multiple “data blocks.”).

deposition Dr. Creusere “attempted to testify that both Hsu’s files as a whole and its 5k file segments could be considered ‘data blocks.’” *Id.* at 9. Patent Owner continues that that Dr. Creusere testified “unequivocally” that his declaration did not include an opinion as to what aspect of Hsu teaches Claim 16’s “data blocks.” *Id.* at 9–10 (citing Ex. 2002, 116:6–118:6).

Patent Owner argues the deficiency in the Creusere Declaration are not cured by the Petition, which “essentially parrots Paragraph 91 of Dr. Creusere’s declaration.” PO Resp. 11 (citing Pet. 16–17). Patent Owner argues the Federal Circuit has made clear that we may not “adopt arguments on behalf of petitioners that could have been, but were not, raised by petitioner during an IPR” and also may not “raise, address, and decide unpatentability theories never presented by the petitioner and not supported by record evidence.” *Id.* at 12 (quoting *In re Magnum Oil Tools*, 829 F.3d 1364, 1380 (Fed. Cir. 2016)).

Patent Owner next argues that Hsu does not anticipate claim 16 because it does not disclose “all elements of the claim within the four corners of the document.” PO Resp. 12 (citing *Net MoneyIN*, 545 F.3d at 1370). Rather, “proof of anticipation also requires that the prior art reference ‘disclose those elements ‘arranged as in the claim.’” *Id.* Relying in part on the Creusere deposition testimony, Patent Owner argues that the outputted “data block” that includes the “null data compression type” of limitation 16[D3], must be the same “data block” that was subject to the “determin[ation] whether or not to compress” of step 16B. *Id.* at 13 (citing Ex. 2002, 67:1–13, 62:7–19, 63:17–[23]). Still citing to the Creusere deposition testimony, Patent Owner contends that “adding new data to a previous ‘data block’ would create a new and different ‘data block.’” *Id.*

(citing 2002, 68:16–69:10). Thus, according to Patent Owner, Petitioner must show that the same “data block” is output as was subject to the determination to compress and its failure to do so is fatal to its Petition because Hsu does not teach claim 16’s limitations as “*arranged in the claim.*” *Id.* at 15.

(b) Hsu Does Not Disclose “whether or not to compress . . . with a particular one or more of several encoders”

In addition to the “data block” limitations, Patent Owner argues Hsu does not determine “whether or not to compress . . . with a particular one or more of several encoders” as required by limitation 16[B]. PO Resp. 15–22. As with its “data blocks” argument, Patent Owner asserts these arguments apply to originally instituted Grounds 1, 2, 5, and 6. *Id.* at 15.

Patent Owner again relies on Petitioner’s expert, Dr. Creusere, to support much of its argument. Patent Owner argues limitation 16[B] recites and the Specification describes that compression must “be made with respect to ***particular*** encoders” and not “by a generalized determination to simply not compress at all.” PO Resp. 15–16 (citing Ex. 2002, 16:6–12, 26:4–28:6). Furthermore, Dr. Creusere’s deposition testimony that “[i]f ***you were to change out the set of encoders, you might fail with one set of encoders and you might succeed with another set***” is relied on by Patent Owner to assert “[c]laim 16 would allow two different sets of encoders to result in different determinations as to whether to compress or not compress the same data block.” *Id.* at 17 (quoting Ex. 2002, 28:3–6).

In sum, Patent Owner argues Hsu’s “determination is based on a threshold requirement that has nothing to do with *particular encoders.*” Tr. 33:10–13 (emphasis added). Thus, according to Patent Owner, in Hsu, if

one of the parameters or “redundancy metrics” measured is greater than 2.5, the file is considered compressible and, if one of the parameters is less than 2.5, the file is considered not compressible. At oral hearing Patent Owner’s argument was presented as follows:

 this determination not to compress is based on an absolute indicator of compressibility. Absolute indicator. It has nothing to do with particular encoders. It’s an absolute indicator.

Id. at 34:1–3; *see also* PO Resp. 17–18 (citing Ex. 1005, 1098, 1102; Ex. 2003 ¶¶ 22–33; Ex. 2002, 102:24–103:1 (“The not compression decision as laid out by Hsu is based entirely on the three redundancy metrics.”)). Patent Owner concludes that “redundancy metrics” are not “encoders.” *Id.* at 19–20 (citing Ex. 2002, 52:19–53:9; *see also id.* at 40:1–41:8 (Dr. Creusere testifying that determinations whether or not to compress based on file size or type is independent of the “operating modes . . . of several encoders”)).

Patent Owner acknowledges that Dr. Creusere also testified that “each of Hsu’s redundancy metrics is associated with certain compression algorithms, and that Hsu’s determination not to compress at all is a determination not to compress with those particular algorithms.” PO Resp. 21 (citing Ex. 2002, 45:1–46:5, 47:10–49:14). Patent Owner contends that Dr. Creusere admitted the entire analysis of limitation 16[B] is contained in paragraphs 92 through 96 of his declaration. *Id.* (citing Ex. 2002, 52:2–9). Patent Owner concludes the above deposition testimony is a new theory not previously presented in the Creusere Declaration. *Id.* (citing Ex. 1002 ¶¶ 92–96).

Patent Owner also rebuts Dr. Creusere’s testimony that the algorithms determine whether or not to compress with its own expert, Dr. Zeger. PO Resp. 22 (citing Ex. 2003 ¶¶ 31–32). Based on the Zeger Declaration, Patent Owner argues a person of ordinary skill “would understand that Hsu’s approach would yield the same determination not to compress *regardless* of the encoders available in the system.” *Id.* (citing Ex. 2003 ¶ 32).

(3) Discussion

Patent Owner’s arguments that Hsu does not disclose “data blocks” or “whether or not to compress . . . with a particular one or more of several encoders” are addressed below.

(a) Hsu Discloses “data blocks”

We agree that Hsu does not *specifically* disclose the recited “data blocks.” However, word for word disclosure in the reference as recited in the claim is not required. *See In re Bond*, 910 F.2d at 832 (whether a reference teaches a claim limitation “is not an ‘ipsissimis verbis’ test”); *Standard Havens Prods., Inc. v. Gencor Indus., Inc.*, 953 F.2d 1360, 1369 (Fed. Cir. 1991) (“An anticipatory reference . . . need not duplicate word for word what is in the claims.”). Relying in part on extrinsic evidence, we found in the Institution Decision that a “block” is defined as “[g]enerally a contiguous collection of similar things that are handled together as a whole.” Inst. Dec. 10 (citing *Microsoft Computer Dictionary*, 55 (3rd ed. 1997) (Ex. 3001)). The term “data block” is not defined separately in the *Microsoft Computer Dictionary* or in the Specification. *Id.* at n.3.

Intrinsic evidence also supports our prior determination. The Specification states that data type and size are important characteristics of a “data block.” Specifically, the Specification states that that “data types, data

structures, data block formats, file substructure, and/or file types” are analyzed. Ex. 1001, 4:40–46; *see also id.* at 3:57–59 (the data stream is analyzed to identify a “data type of the data block”). The data stream includes “data blocks that may range in size from individual bits through complete files or collections of multiple files.” *Id.* at 6:56–59. That a data block is described as a “collection of multiple files” is consistent with the dictionary definition of “block” as “[g]enerally a contiguous collection of similar things that are handled together as a whole.” *See* Inst. Dec. 10. The Specification supports a finding that the data type dictates what constitutes a data block, that a “data block” may be grouped into “data blocks,” and that a data block may be a collection of multiple files. *Id.*

We also find a factual basis for Dr. Creusere to conclude that limitation 16[B], reciting in part “determining whether or not to compress each one of said plurality of data blocks,” is disclosed by Hsu. *See*, Ex. 1002 ¶¶ 92–96. For example, Dr. Creusere specifically concludes, that Hsu discloses limitation 16[B] relating to the determination to compress “each one of said plurality of data blocks.” *Id.* ¶ 93. The preceding conclusion is based, in part, on a determination from Hsu’s disclosure that “the best algorithm to use in compressing *each block of data in a file* (possibly a different algorithm for each block)” is used for the compressibility determination. Ex. 1002 ¶ 63 (citing Ex. 1005, 1097, 1103) (emphasis added); Pet. Reply 3. Petitioner’s Reply quotes the Creusere Declaration as additional support: “Hsu’s process for characterizing the **data blocks** is performed ‘one **5K block** at a time,’ and for ‘**each block.**’” Pet. Reply 3 (citing Ex. 1002 ¶ 62 (citing Ex. 1005, 1108–1109), *see also id.* ¶ 64 (“the Hsu system first determines the data type and compressibility of each

data block, and then selects the optimal algorithm based on the block's data type and compressibility.”)); Pet. 10.

Dr. Creusere also discusses “compressibility” in the context of data blocks is “accomplished in two phases: the pre-compression phase and the compression phase.” Ex. 1002 ¶ 64 (citing Ex. 1005, 1102); Pet. Reply 3; Pet. 10. The Creusere Declaration states that:

To evaluate the compressibility properties of each data block, Hsu computes and compares the results of various analyses of the contents of the data blocks (which Hsu calls “redundancy metrics”) to determine which of the following three different types of data redundancies are most prevalent in a given data block.

Ex. 1002 ¶ 67 (citing Ex. 1005, 1104). As discussed above, the Petition discusses the first phase and how the “data type,” as well as the type of redundancy of the data, are used to determine the compressibility of the “block of data” and the appropriate algorithm. Pet. Reply 3–4 (citing Ex. 1002 ¶¶ 72, 95 (citing Ex. 1005, 1103); Pet. 18. The Creusere Declaration also concludes that Hsu discloses that the highest redundancy metric (out of the three disclosed in Hsu) for a data block indicates “the most prevalent type of redundancy in the data block.” Ex. 1002 ¶ 71 (citing Ex. 1005, 1106); Pet. Reply 4; Pet. 10.

Turning to the second or compression phase, Dr. Creusere explains that “Hsu provides that ‘[t]he compressor determines and then applies the selected algorithms to the blocks separately.’” Ex. 1002 ¶ 95 (citing Ex. 1005, 1098); Pet. Reply 5; Pet. 18, 20. Dr. Creusere relies on how the compression occurs to “blocks” as found in Hsu, quoting references to “block,” including: “which indicates where in the compressed file a

compressed block begins and ends;” “if the block was already marked uncompressible;” “the full block length;” and “[u]pon reaching the end of the blocks.” Ex. 1002 ¶ 105 (citing Ex. 1005, 1109); Pet. Reply 5–6; Pet. 20–22.

Although not mentioned in the Petition or the Creusere Declaration, Hsu discloses “the best algorithm to use in compressing each *block of data in a file*,” i.e., a “data block.” Ex. 1005, 1097 (Summary) (emphasis added); *see also* Pet. Reply 1 (arguing Hsu uses “block of data”). Instead, the Petition and the Creusere Declaration have shown numerous instances where Hsu discusses “blocks.” Pet. 20–22; Ex. 1002 ¶ 105 (citing Ex. 1005, 1109).

In the context of Hsu and as compared to claim 16, we find no meaningful difference between the blocks described in Hsu, or “block of data,” and the claimed “data blocks.” Therefore, Petitioner has met its burden of showing that Hsu discloses, “data blocks” as would be understood by a person of ordinary skill in the art. *See, e.g.*, Ex. 1002 ¶ 91 (“A person of ordinary skill in the art would understand that Hsu’s disclosure of heterogeneous files that are best compressed on a block-by-block basis requires receiving a plurality of data blocks.”); Pet. 17. Patent Owner’s argument to the contrary does not explain, beyond the use of different wording, why the recited “data blocks” are different from the heterogeneous files or “blocks” of Hsu that the Creusere Declaration cites.

We are not persuaded that the Creusere Deposition supports Patent Owner’s argument that neither the Creusere Declaration nor the Petition make the necessary assertions to show that Hsu discloses “data blocks.” In his deposition, Dr. Creusere explained his conclusion that Hsu discloses “data blocks,” admitting the exact wording is not present but stating that Hsu

includes “things that would be analogous to the data blocks.” Ex. 2002, 59:22–61:10. *Id.* Patent Owner acknowledges that at his deposition Dr. Creusere “attempted to testify that both Hsu’s files as a whole and its 5k file segments could be considered ‘data blocks.’” PO Resp. 9 (citing Ex. 2002, 116:6–118:6). Dr. Creusere did not “attempt” to testify; rather, he testified. The entirety of the Creusere Deposition is part of the record. While arguably supporting Patent Owner, when considered as a whole, the Creusere Deposition testimony is consistent with the Creusere Declaration and the Petition.

Based on the preceding, we credit Dr. Creusere’s testimony, including both the Creusere Declaration and deposition, that Hsu discloses the recited “data blocks.” Patent Owner does not cite to the Zeger Declaration to support its “data block” argument. Our review of the Zeger Declaration confirms that it does not refute the testimony of Dr. Creusere regarding “data blocks,” nor is any testimony provided but not cited that supports Patent Owner’s position.

Patent Owner argues Petitioner must show a determination to compress must occur with respect to the same “data block” that is output. PO Resp. 15.⁹ Patent Owner argues Petitioner has not shown Hsu compresses, or not, the same block that is output. Thus, Hsu has not been

⁹ Claim 16 requires that if a determination is made to compress, then a “particular one of said plurality of data blocks” is compressed with its “compression type descriptor.” Ex. 1001, 28:17–22. Then, the “particular one” data block, and its compression type descriptor, are “outputted.” *Id.* at 28:23–24. Conversely, a determination not to compress a “particular one” of said data blocks results in outputting the “particular one” data block and its associated “null data compression type descriptor.” *Id.* at 28:25–28, 29–30.

shown to be arranged in the same way as recited by the claims. *Id.* at 12–13 (citing *Net MoneyIN*, 545 F.3d at 1370); Tr. 30:8–22. This argument is not persuasive. If the determination made is to compress (limitation 16[C]), Hsu states that “[t]he compression method for the current block is then recorded in a small array-based map of the file.” See Pet. 20 (citing Ex. 1005, 1102; Ex. 1002 ¶ 101) (emphasis added). If the determination is made not to compress (limitation 16[D]), Hsu discloses “[a]n identifying tag for the selected algorithm is written to the ‘compression plan’, an array which stores one complete compression instruction per block (*if the current block is deemed uncompressible, a ‘skip’ instruction is recorded*).” See Pet. 21 (citing Ex. 1005, 1109; Ex. 1002 ¶ 104) (emphasis added).

Thus, Hsu discloses a determination to compress, or not compress, on the “current” block. Further, a descriptor type or a “skip instruction” is recorded for “current” data block in a file map or compression plan. Finally, Hsu discloses “an *output buffer*, while the compressed length (which indicates where in the compressed file a compressed block begins and ends) and compression method are recorded in a separate history *for reference at decompression time*.” Pet. 20–21 (citing Ex. 1005, 1109; Ex. 1002 ¶ 105) (emphasis added). If a “no compression” determination is made or “if the block was already marked uncompressible, then the data is *copied directly to the output buffer* (the full block length and a code for ‘no compression’ are recorded in the compression history).” *Id.* at 22 (emphasis added). Based on the preceding, we find that the compression process and decompression, or output, occurs on the same block for which a determination on compression was made in the first instance.

(b)Hsu Discloses “whether or not to compress . . . with a particular one or more of several encoders”

Patent Owner argues Hsu’s determination not to compress is based on an “absolute indicator,” i.e., the 2.5 compressibility threshold, and has nothing to do with the claimed “particular encoders.” Tr. 33:19; PO Resp. 16–17 (citing Ex. 2002, 26:4–28:6). Thus, Patent Owner argues limitation 16[B] is not disclosed by Hsu. PO Resp. 17–18.

First, we agree with the Creusere Declaration that Hsu references “at least one encoder” when it references a “compression algorithm” or “algorithm.” See Ex. 1002 ¶ 93. Neither Patent Owner nor the Zeger Declaration disputes this. Further, we find that the 2.5 threshold Hsu provides as an “absolute indicator” of compressibility is relevant to the determination is made whether or not to compress. See Pet. Reply 11–12. If the determination is that the block *is compressible*, Hsu uses the block type and largest metric to select “the appropriate compression algorithm” from the “compression algorithm database.” See *id.* at 12 (citing Ex. 1005, 1102, Table 1). Thus, Patent Owner’s arguments that there are no “particular encoders” when a when the determination is *to not compress* are not persuasive with respect to the condition where the block *is compressed*.

Petitioner supports its position on encoders associated with compression by citing the Creusere Declaration as follows:

“If at least one of the parameters is greater than 2.5, the file is considered compressible,” and the “maximum of the normalized metrics is then selected and ***used in conjunction with the file type to select the appropriate compression algorithm*** from the lookup table” taught in the Hsu reference.

Pet. Reply 13–14 (citing Ex. 1002 ¶ 71 (quoting Ex. 1005, 1106)). When the determination is made to compress, Hsu’s calculated redundancy metrics

are associated with different specific compression algorithms, i.e., the claimed “a particular one or more of several encoders.” *See id.* at 14 (citing Ex. 1005, 1104, Table 1). For the ANSI data type, the Alphabetic Distribution Metric (MAD) is associated with “arithmetic coding,” while the Average Run Length Metric (MRL) is associated with “run length encoding,” and the String Repetition Ratio Metric (MSR) is associated with Lempel-Ziv encoding. *Id.* at 13 (citing Ex. 1005, Table 1).

Patent Owner relies on the Zeger Declaration testimony that Hsu does not teach limitation 16[B], “making a determination not to compress data with respect to ***particular encoders***.” PO Resp. 17 (citing Ex. 2003 ¶¶ 22–33). Dr. Creusere’s deposition is cited for much of the factual support for Dr. Zeger’s opinions. *See, e.g.*, Ex. 2003 ¶¶ 22–24. For example, Dr. Zeger agrees with Dr. Creusere’s deposition testimony that “the plain language of limitation 16[B] requires that a determination not to compress a data block must be made with respect to ***particular*** encoders and that a general determination not to compress the data block at all would not meet the requirements of limitation 16[B].” *Id.* ¶ 25. However, the cited testimony of Dr. Creusere does not state anything about “not meet[ing]” limitation 16[B] but rather states agreement with the plain and ordinary meaning of parts of claim 16 read to him during a deposition. *See id.* ¶¶ 23–24 (quoting the Creusere Deposition). Ultimately, Dr. Zeger disagrees with the opinion of the Creusere Declaration and that part of the Creusere Deposition that Hsu teaches limitation 16[B]. *See* Ex. 2003 ¶ 26 (citing Ex. 1002 ¶¶ 92–96), *id.* ¶¶ 31–32 (citing Ex. 2002, 45:1–49:3, 47:10–49:14).

To the extent Dr. Zeger provides independent opinions based on Hsu, those opinions are limited to the determination not to compress. Ex. 2003

¶ 30. As to the determination to compress, Dr. Zeger agreed “there is a ‘correlation’ and ‘relation’ between the redundancy metrics and the available compression options.” Pet. Reply 16 (citing Ex. 1033, 146:6–21). We credit Dr. Creusere’s testimony based on Hsu over the testimony of Dr. Zeger, which relies on selected parts of Dr. Creusere’s deposition testimony and does not sufficiently, if at all, address the “to compress” limitation.

We agree with Petitioner that the claim language of limitation 16[B] requires either a determination to compress or a determination not to compress. Pet. Reply 16–17; *see also* Section III.A.4 (construing limitation 16[B] under *Schulhauser*). We have construed limitation 16[B] under *Schulhauser* as met by either a determination “to compress” or a determination “to not compress.” When the determination is to compress, the algorithms used by Hsu for compression have been shown by a preponderance of the evidence to be the recited “encoder.” *See* Ex. 1005, 1103, Table 1 (illustrating specific algorithms with different data types); Ex. 1002 ¶ 93 (Hsu refers to “at least one encoder” as a “compression algorithm” or “algorithm”).

Petitioner has shown by a preponderance of the evidence that claim 16 is anticipated by Hsu.

c. Claims 32, 34, and 35

We have reviewed Petitioner’s argument and evidence relating to claims 32, 34, and 35, all of which depend from claim 16. Pet. 22–25. Patent Owner does not argue separately claims 32, 34, and 35. Our summary of Petitioner’s showing is below.

Claim 32 recites, in pertinent part, the method of claim 16 “wherein the size of each one of said plurality of data blocks is variable.” Ex. 1001,

30:1–2. Petitioner argues that Hsu discloses “the length of a compressed block varies with both the length of the original block and the compression method used.” Pet. 23 (citing Ex. 1005, 1109; Ex. 1002 ¶ 148).

Claim 34 recites, in pertinent part, the method of claim 16 “wherein said at least one of said several encoders is provided as a software module.” Ex. 1001, 30:5–6. Petitioner argues Hsu’s system includes “a driver module, four block analysis modules, and the synthesis module, which includes the database of compression algorithms. All modules are written in C and were tested on a Unix platform.” Pet. 23 (citing Ex. 1005, 1008). Relying on the Creusere Declaration, Petitioner argues a person of ordinary skill would understand Hsu’s encoders are software modules. *Id.* at 23–24 (citing Ex. 1002 ¶¶ 148, 155, 156 (quoting *McGraw-Hill Dictionary of Scientific and Technical Terms* 616 (Ex. 1009); Ex. 1005, 1108; citing *Microsoft Computer Dictionary* 162 (3rd ed. 1997) (Ex. 1010)).

Claim 35 recites, in pertinent part, the method of claim 16 “wherein at least one of said several encoders is lossless.” Ex. 1001, 30:7–8. Petitioner cites the Creusere Declaration for the proposition that a person of ordinary skill “would have understood that arithmetic coding, Lempel-Ziv, and run-length encoding,” all of which are disclosed in Hsu, “are all forms of lossless encoding.” Pet. 24 (citing Ex. 1002 ¶ 159; Ex. 1005, 1106).

Petitioner has shown by a preponderance of the evidence that claims 32, 34, and 35 are anticipated by Hsu.

d. Summary of Anticipation by Hsu (claims 16, 32, 34, and 35)

Petitioner has shown by a preponderance of the evidence that claims 16, 32, 34, and 35 are anticipated by Hsu.

2. Anticipation by Franaszek (claims 16–19, 32, 34, and 35)

Petitioner alleges that claims 16–19, 32, 34, and 35 are anticipated under 35 U.S.C. § 102 by Franaszek. Pet. 4, 30–46 (Ground 3). Petitioner’s supporting evidence includes the Creusere Declaration. Ex. 1002 ¶¶ 161–177, 190–211, 221–227, 230–234. This Ground was not instituted in the Institution Decision but added afterwards. See Inst. Cor. Order 2.

a. Franaszek Overview (Ex. 1006)

Franaszek describes “compressing and decompressing data using a plurality of data compression mechanisms.” Ex. 1006, Abstract. A compressor tests representative samples of each data block to select an optimal compression mechanism for each block. *Id.* at 5:19–44, 6:7–50. The size of the sample block, as compressed by each of a number of methods, is stored in a table, and the best method is selected by finding the smallest compressed block. *Id.* at 5:26–29. “If the best sample compression does not satisfy a threshold condition (e.g. 30% compression as compared to the uncompressed sample), then it is decided at this point not to compress the block,” and “the block will be stored in uncompressed format.” *Id.* at 5:29–33. Otherwise, the block is compressed using the best method found, and the compressed data block is output. *Id.* at 5:34–38.

“The block is then compressed using the selected one of the mechanisms and the compressed block is provided with an identifier of the selected mechanism.” Ex. 1006, 3:34–36. “Each block of data includes a coding identifier which is indicative of the method or mechanism used to compress the block.” *Id.* at 3:40–45. Franaszek discloses that the applied compression method is recorded in a “compression method description (CMD) area . . . in the compressed block.” *Id.* at 4:54–59.

b. Claim 16

The parties' positions are summarized below followed by our analysis. We adopt the following showing of Petitioner with respect to each referenced limitation of claim 16. Patent Owner makes two arguments to the contrary, which are presented in Sections III.B.2.b(2) below, followed by our discussion in Sections III.B.2.b(3).

(1) Petitioner's Arguments and Supporting Evidence

Limitation 16[A] recites "[a] method comprising: receiving a plurality of data blocks." Petitioner argues Figure 2 of Franaszek shows a data compressor 220 receives a plurality of data blocks 210. Pet. 31 (citing Ex. 1006, Fig. 2).

Limitation 16[B] recites "determining whether or not to compress each one of said plurality of data blocks with a particular one or more of several encoders." Franaszek discloses that "samples of each block of data are tested to select an appropriate one of the data compression mechanisms to apply to the block." Ex. 1006, 3:30–34. Petitioner cites this disclosure from Franaszek and quotes from the Creusere Declaration to allege that "[b]ased on the compression ratios provided by each compression mechanism, the compressor decides whether or not to compress each block." Pet. 31 (quoting Ex. 1002 ¶ 163). Petitioner also provides an annotation of Figure 4B of Franaszek, calling out step 457, where a determination whether or not to compress "data block B" is made. *Id.* at 32 (citing Ex. 1006, Fig. 4B (annotated at Pet. 32), 6:41–47; Ex. 1002 ¶ 164).

Limitation 16[C] recites:

if said determination is to compress with said particular one or more of said several encoders for a particular one of said plurality of data blocks [C1];

compressing said particular one of said plurality of data blocks with said particular one or more of said several encoders to provide a compressed data block [C2];

providing a data compression type descriptor representative of said particular one or more of said several encoders [C3];

outputting said data compression type descriptor and said compressed data block [C4].

Relevant to the “determination” limitation 16[C1], Petitioner relies on Franaszek’s Abstract, describing that “[r]epresentative samples of each block of data are tested to select an appropriate one of the data compression mechanisms to apply to the block.” Pet. 33 (quoting Ex. 1006, Abstract).

For the “compressing” limitation 16[C2],¹⁰ Petitioner cites to Franaszek’s disclosure that “each method or (method, dictionary) pair is tested on a sample taken from the uncompressed data block 205, and the resulting sample compression is saved.” Pet. 33 (citing Ex. 1006, 5:19–26, 6:22–29; Ex. 1002 ¶ 168). Once a “best” method is found by comparing compressed and uncompressed sample sizes using each method, Franaszek uses that best method to compress the block. *Id.* (citing Ex. 1006, 5:19–26, 5:27–39, 6:33–35, 6:43–47; Ex. 1002 ¶ 168).

For the “data compression type descriptor” limitation 16[C3], Petitioner argues Franaszek records compression method used in a “compression method description (CMD)” of the compressed block.

¹⁰ The Petition does not break claim 16 into [C1] through [C4] subparts. The Petition addresses all of the limitations under the umbrella of 16[C]. Thus, the preceding showing in the Petition relating to limitation 16[C1] also describes selection of a data compression mechanism.

Pet. 34–35 (citing Ex. 1006, Fig. 2 (annotated at Pet. 35), Abstract, 3:34–36, 4:54–59; Ex. 1002 ¶ 169). As for the descriptor, Petition quotes from Franaszek that “[e]ach block of data includes a coding identifier which is indicative of the method or mechanism used to compress the block.” *Id.* at 34 (quoting Ex. 1006, 3:40–45).

For the “outputting” limitation 16[C4], Petitioner annotates Franaszek Figure 2, outlining in red the compression method description (CMD) areas referenced above. Pet. 35 (citing Fig. 2 (annotated at Pet. 35)). Franaszek outputs the previously stored CMD (Fig. 4C) and the compressed block from step 457 of Figure 4B described above. *Id.* (citing Ex. 1006, 6:43–50, Fig. 4C; Ex. 1002 ¶ 171).

Limitation 16[D] recites “if said determination is to not compress said particular one of said plurality of data blocks [D1]; providing a null data compression type descriptor representative of said determination not to compress [D2]; and outputting said null data compression type descriptor and said particular one of said plurality of data blocks [D3].”

Franaszek discloses a compressor that determines whether “the block will be stored in uncompressed format.” Ex. 1006, 5:25–34. Franaszek discloses that “[e]ach block of data includes a coding identifier which is indicative of the method or mechanism used to compress the block.” *Id.* at 3:40–42. The preceding disclosures from Franaszek form the basis for Dr. Creusere’s testimony that

[t]he coding identifier is used by the de-compressor as an index to the compression method table 240. . . . It is inherent that the coding identifier and compression method table must include an indication for data blocks that were not compressed by the compressor, in view of Franaszek’s teaching that certain data blocks are stored in uncompressed format in the second memory

and in view of Franaszek's teaching that "**each** block of data includes a coding identifier."

Ex. 1002 ¶ 177 (quoting Ex. 1006, 3:40–42) (citing Ex. 1006, 5:1–7).

Petitioner cites to the preceding from the Creusere Declaration as support for its contention that "Franaszek inherently discloses providing a null data compression type descriptor representative of said determination not to compress, and outputting said null data compression type descriptor and said particular one of said plurality of data blocks" as recited in limitations 16[D2] and [D3]. Pet. 37.

(2) Patent Owner's Argument and Supporting Evidence

Patent Owner's Supplemental Response (Paper 32) to the Petition relies on arguments it made in its Preliminary Response (Paper 10). Supp. Br. 1 (citing Prelim. Resp. 29–37). In its Preliminary Response, Patent Owner first addresses the "coding identifier," which Franaszek uses to identify the method used to compress a block. Prelim. Resp. 30 (citing Pet. 37). Patent Owner argues the "coding identifier" is not "representative of said determination not to compress" and that it is not "inherent" that Franaszek "**must** include an indication for data blocks that were **not** compressed by the compressor." *Id.* Patent Owner argues Franaszek discloses that if, for example, a block does not meet a threshold condition, it is not compressed. *Id.* at 31–32 (citing Ex. 1006, 5:29–32, Fig. 3). Patent Owner notes the flow chart, Figure 4B of Franaszek, shows where a determination is made not to compress an input data block. *Id.* at 33; *see also id.* at 33–34 (citing Ex. 1006, 6:41–50, Figs. 3, 4B, 4C). Based on the preceding, Patent Owner concludes "Franaszek only stores coding identifiers

in compressed data blocks and does not store such information in uncompressed data blocks.” *Id.* at 34.

In a similar argument, Patent Owner’s Preliminary Response argues Franaszek’s compression method description (CMD) table stores coding identifiers for compressed data blocks, not uncompressed data blocks. Prelim. Resp. 34–35 (citing Ex. 1006, Fig. 2 (uncompressed data blocks have optional information but not a CMD), 4:30–31, 55–59). Based on the preceding disclosures regarding the CMD, Patent Owner concludes “Franaszek does not describe a CMD area where coding information could possibly be stored in data blocks that it decides not to compress.” *Id.* at 35.

Patent Owner notes Petitioner does not assert that Franaszek expressly discloses limitation 16[D2] but relies on inherency. Prelim. Resp. 35–37. Patent Owner contends Petitioner’s inherency position lacks the requisite supporting evidence that the prior art necessarily includes the claimed limitation. *Id.* at 35–36 (citing *MEHL/Biophile Int’l Corp. v. Milgraum*, 192 F.3d 1362, 1365 (Fed. Cir. 1999). Patent Owner cites *Bettcher Industries, Inc. v. Bunzl USA, Inc.*, 661 F.3d 629, 639–40 (Fed. Cir. 2011), for its holding that “[i]nherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” Prelim. Resp. 36. Patent Owner argues that the Creusere Declaration also lacksevidentiary support for its inherency conclusion. *Id.*

Patent Owner concludes its argument by pointing out that our Institution Decision accepted the arguments from the Preliminary Response and did not institute originally on the ground that Franaszek anticipates claims 16 or 17–19. Supp. Br. 1 (citing Inst. Dec. 24–25).

(3) Discussion and Conclusion

Patent Owner’s reliance on the Institution Decision is misplaced for several reasons. First, our Institution Decision was corrected to include the Franaszek anticipation ground. Inst. Cor. Order 2. Second, Patent Owner was given notice and opportunity to brief, and submit evidence if desired, on the Franaszek ground. Paper 30, 4. Petitioner and Patent Owner decided on a briefing schedule (email dated May 14, 2018 from the parties to Trials@uspto.gov, Ex. 3002) prior to our Order (Paper 30).

Patent Owner did not seek more extensive briefing, or otherwise raise any objection based on notice or due process in responding to the additional ground added. The circumstances have reincarnated the ground based on Franaszek, which, now that we consider the alternative condition holding of *Schulhauser*, create another basis for unpatentability of claim 16. For reasons set forth in Section III.A.4.a above, we found that *Schulhauser* does apply here.¹¹

Considering the additional ground in view of *Schulhauser* requires a different result from that in the Institution Decision. Limitation 16[B] is followed by two alternatives, limitations 16[C] and 16[D]. Limitation 16[C] applies “*if said determination is to compress.*” Limitation 16[D] applies “*if said determination is to not compress.*” Petitioner has shown the “data compression type descriptor” limitation relative to compression limitation 16[C3]. Petitioner’s evidence includes that Franaszek records a compression

¹¹As noted in Section I, we specifically asked the parties to address *Schulhauser* in their supplemental briefing on the newly added grounds. Paper 30, 3–4. Patent Owner’s supplemental brief relies on arguments made in its post hearing brief (Paper 26) on *Schulhauser*. Paper 32 (relying on Paper 26, 1–5). Patent Owner made no new arguments.

method used in a “compression method description (CMD)” of the compressed block. Pet. 34–35 (citing Ex. 1006, Fig. 2 (annotated at Pet. 35), Abstract, 3:34–36, 4:54–59; Ex. 1002 ¶ 169). As for the descriptor, Petition quotes from Franaszek that “[e]ach block of data includes a coding identifier which is indicative of the method or mechanism used to compress the block.” *Id.* at 34 (quoting Ex. 1006, 3:40–45).

Patent Owner does not dispute that the compression limitation 16[C] is shown, only that the determination to not compress is not shown to have the required “null data compression type descriptor.” This is insufficient under *Schulhauser* and, conversely, Petitioner has shown sufficiently that claim 16 is unpatentable as anticipated by Franaszek.

c. Claims 17–19

We have reviewed Petitioner’s argument and evidence relating to claims 17–19. Pet. 37–44. Claims 18 and 19 depend from claim 17. Patent Owner does not separately argue claims 17–19.

Claim 17 recites in pertinent part, the method of claim 16, further “comprising: . . . transmitting said data compression type descriptor and said compressed data block if said determination is to compress with a particular one or more of said several encoders for a particular one of said plurality of data blocks.” Ex. 1001, 28:36–40. We find substantial evidence that Franaszek determines whether or not a data block is compressed. *See* Ex. 1006, Fig. 4B (step 457); 5:25–34. Further, Petitioner has identified sufficient disclosure in Franaszek for “transmitting a *data compression type descriptor* and said compressed block,” citing Franaszek’s disclosure that “[t]he compressor outputs compressed data blocks 230, with an index (M) 232 identifying the selected compression method, and for dictionary-based

methods, dictionary block identifier (D), encoded in a compression method description (CMD) area 235 in the compressed block.” Pet. 38 (quoting Ex. 1006, 4:54–59; see 3:34–36, 3:40–45; Ex. 1002 ¶ 193).

As discussed above in connection with limitation 16[B], *Schulhauser* is applicable to the claimed alternative conditions of claim 17. Thus, Petitioner need not show that Franaszek also discloses a “coding identifier” which includes a “null data compression type descriptor.”

Petitioner has also shown limitation 17[B], “receiving: . . . said data compression type descriptor and said compressed data block and decompressing said compressed data based on said data compression type descriptor.” Ex. 1001, 28:46–48. Petitioner cites to Franaszek’s disclosure of a “de-compressor” that receives and examines a coding identifier “to select an appropriate one of the data decompression mechanisms to apply to the block. The block is then decompressed using the selected one of the mechanisms.” Pet. 47 (citing Ex. 1006, 3:37–46; Ex. 1002 ¶ 197). Again, *Schulhauser* applies and the alternative “null data compression type descriptor” of claim 17 need not be shown for the claim to be found anticipated.

Claim 18 depends from claim 17 and recites “wherein said several encoders are lossless encoders.” Ex. 1001, 28:49–50. Petitioner cites to Franaszek’s claim 3, which depends from claim 1 and recites, “wherein the data compression mechanisms are selected from at least two of a run-length encoder, an adaptive dictionary and a static dictionary.” Pet. 41–42 (citing Ex. 1006, claim 3). Relying on the Creusere Declaration, Petitioner concludes run-length encoding, dictionary-based compression, and Lempel-Ziv 1 (“LZ1”) encoders are all lossless. *Id.* at 42 (citing Ex. 1002 ¶ 203).

Petitioner also cites to the '867 patent as recognizing these, among several, compression methods are lossless. *Id.* (citing Ex. 1001, 15:9–13; see also Ex. 1002 ¶¶ 202–204 (discussing known lossless compression techniques)).

Claim 19 depends from claim 17 and recites “wherein at least two of said several encoders are in a parallel configuration.” Ex. 1001, 28:51–52. Petitioner cites to Figure 4B of Franaszek as teaching “a compressor that applies various methods of compression in serial.” Pet. 42 (citing Ex. 1006, Fig. 4B; Ex. 1002 ¶ 209). However, Petitioner alleges that Franaszek expressly discloses that “although the figure shows a sequential loop, implementations are possible in which all these tests are performed in parallel.” *Id.* at 44 (quoting Ex. 1006, 6:28–32; Ex. 1002 ¶ 210).

Petitioner has shown sufficiently that claims 17–19 are unpatentable as anticipated by Franaszek.

d. Claims 32, 34, 35

We have reviewed Petitioner’s argument and evidence relating to claims 32, 34, and 35. Pet. 37–46. Claims 32, 34, and 35 depend from claim 16. We adopt our analysis of claim 16 from Section III.B.2. We also adopt Petitioner’s argument and evidence as summarized below. Patent Owner does not argue separately claims 32, 34, and 35.

Claim 32 recites, in pertinent part, the method of claim 16 “wherein the size of each one of said plurality of data blocks is variable.” In determining whether or not to compress a block, Petitioner argues Franaszek provides “[i]f **all uncompressed input blocks are a given fixed size**,” the threshold for compression can be constant. Pet. 44 (citing Ex. 1006, 6:33–44). If input blocks are not of fixed size, Franaszek discloses “the threshold can be computed as a function of the input block size.” *Id.* Petitioner

concludes that “Franaszek expressly recognizes that the uncompressed input blocks may be of a non-fixed (*i.e.* variable) size.” *Id.* (citing Ex. 1002 ¶ 223).

Claim 34 recites, in pertinent part, the method of claim 16 “wherein said at least one of said several encoders is provided as a software module.” Franaszek discloses in Figure 7 “a block diagram of an encoder/decoder in a compression system, in accordance with the principles of the present invention.” Ex. 1006, 7:37–39. Franaszek also includes “CODECs 702, 704, 706 which perform both the encoding and decoding functions as determined by control data sent from the microprocessor 708.” *Id.* at 7:44–47. Further, “[t]he CODECs can be embodied in hardware logic circuits or as program code executed by microprocessor 708.” Pet. 45. Petitioner relies on the preceding and the Creusere Declaration, concluding that “[t]he CODECs embodied as ‘program code’ are encoders provided as software modules.” *Id.* (citing Ex. 1002 ¶ 227).

Claim 35 recites, in pertinent part, the method of claim 16 “wherein at least one of said several encoders is lossless.” Petitioner cites to Franaszek’s claim 3, which depends from claim 1 and recites, “wherein the data compression mechanisms are selected from at least two of a run-length encoder, an adaptive dictionary and a static dictionary.” Pet. 45–46 (citing Ex. 1006, claim 3). Relying on the Creusere Declaration, Petitioner concludes run-length encoding, dictionary-based compression, and LZ1 encoders are all lossless. *Id.* at 46 (citing Ex. 1002 ¶ 232). Petitioner also cites to the ’867 patent as recognizing these, among several, compression methods are lossless. *Id.* (citing Ex. 1001, 15:9–13; *see also* Ex. 1002 ¶ 233 (discussing known lossless compression techniques)).

d. Summary of Anticipation by Franaszek

Petitioner has shown by a preponderance of the evidence that claims 16–19, 32, 34, and 35 are anticipated by Franaszek. Specifically, we credit the Creusere Declaration where cited.

C. 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.” 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 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.

In re Nuvasive, Inc., 842 F.3d 1376, 1381 (Fed. Cir. 2016) (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*, 829 F.3d at 1380. 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 Supreme Court in *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007)

explained,

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.

1. Person of Ordinary Skill in the Art

Petitioner asserts “[a] person of ordinary skill in the art relevant to the ’867 Patent would have had an undergraduate degree in computer science, computer engineering, electrical and computer engineering, electrical engineering, or electronics and two years of experience working with data compression or a graduate degree focusing in the field of data compression.” Pet. 15 (citing Ex. 1002 ¶¶ 26–28). We adopted Petitioner’s proposal in the Institution Decision. Inst. Dec. 26.

Patent Owner does not state a position. None of the parties’ obviousness arguments are based on another level of skill. The level of ordinary skill in the art remains as set forth above.

2. Prior Art

The following references are alleged to be prior art.

a. Hsu Overview (Ex. 1005)

Hsu is described in section III.B.1.a above.

b. Franaszek Overview (Ex. 1006)

Franaszek is described in section III.B.2.a above.

c. Langdon, Jr. Overview (Ex. 1007)

Langdon, Jr. is a compaction data system where the data to be stored on media is encoded and formatted to take less space. Ex. 1007, Abstract.

As disclosed, Langdon, Jr. applies to a tape drive system. *Id.* Compacted sets of data are sequenced and formed into packets. *Id.*

Each packet includes a packet header, packet data and a packet trailer. Ex. 1007, 10:44–47. The packet data field contains data received in either compacted or noncompacted form as determined by the presence of a compaction flag in a packet flag byte. *Id.* at 10:47–50. When the packet data is not compacted, the packet data field starts with the first byte of the packet data field. *Id.* at 10:51–54.

Figure 4 of Langdon, Jr. is reproduced below.

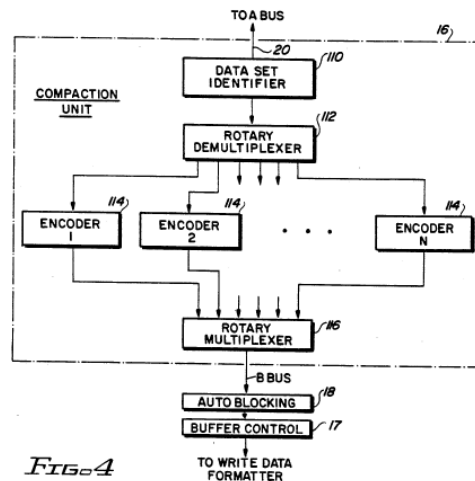


Figure 4 is a diagram of the compaction system showing the write data flow. Ex. 1007, 4:50–52. As shown in Figure 4, compaction unit 16 includes data set identifier 110, rotary demultiplexer 112, a plurality of encoders 114, and rotary multiplexer 116. *Id.* at 12:12–14. The rotary demultiplexer 112 accepts the stream of data and directs one set in turn to each of encoder units 114. *Id.* at 12:14–16.

3. Obviousness over Hsu (claims 17 and 18)

Petitioner alleges that claims 17 and 18 would have been obvious under 35 U.S.C. § 103 over Hsu. Pet. 4, 25–30 (Ground 2). Patent Owner

argues the Petition does not allege the differences between claims 17 and 18 and the prior art. PO Resp. 36–37. Patent Owner also argues that Hsu does not disclose claim 18 because not “*all* of the ‘several encoders are lossless encoders.’” *Id.* at 33 (emphasis added).

a. Claims 17 and 18

Claim 17 depends from claim 16 and recites, in pertinent part, first, in limitation 17[A], “transmitting” either “said null data compression type descriptor and said particular one of said plurality of data blocks . . .” or “said data compression type descriptor and said compressed data block” depending respectively on whether determination is not to compress or to compress.

Second, limitation 17[B] recites “receiving” either “said null data compression type descriptor and said particular one of said plurality of data blocks” or “said data compression type descriptor and said compressed data block and decompressing said compressed data based on said data compression type descriptor” depending respectively on whether determination is not to compress or to compress. Ex. 1001, 28:31–48 (emphasis added).

Claim 18 depends from claim 17 and recites that “said several encoders are lossless encoders.” *Id.* at 28:49–50.

(1)Petitioner’s Arguments and Supporting Evidence

With respect to the limitations of independent claim 16, Petitioner relies on essentially the same arguments as it presents for anticipation purposes. Pet. 25. We agree with Petitioner for the same reasons explained above regarding anticipation by Hsu. *See* Section III.B.1.b above.

As to claim 17’s recitation of “transmitting,” Petitioner cites to the teaching in Hsu that “[t]he compression method for the current block is then recorded in a small array-based map of the file.” Pet. 25 (citing Ex. 1005, 1102, 1109 (“identifying tags” relating to the compression method are written into the “compression plan” and “prepended to the compressed file”); Ex. 1002 ¶¶ 109–110). Petitioner further relies on Dr. Creusere, who explains, *inter alia*, “[a] person having ordinary skill in the art would have understood that Hsu could be used for distributing packages of heterogeneous files over a network, such as the Internet.” Pet. 26 (quoting Ex. 1002 ¶¶ 112, 113 (“[T]ransmitting the compression history as well as the data blocks would have been obvious, given that the compression history is taught to be ‘necessary’ to guide the decompression process on the receiving side of the communication.”)).

As to claim 17’s recitation of “receiving,” Petitioner cites to Hsu’s teaching that “[w]hen decompression is invoked, the driver module opens the compressed file, interprets the history tag and performs the necessary operations.” Pet. 28 (quoting Ex. 1005, 1109); *see* Ex. 1002 ¶¶ 124, 125 (“Hsu[’s system] may determine not to compress certain data blocks.”). Further quoting Dr. Creusere, Petitioner argues “[u]sing tags in this way is ‘exactly what Hsu does in his algorithm when he expressly states that certain data blocks will not be compressed as indicated by a “skip” instruction in the compression plan and a code for “no compression” in the compression history, which is prepended to the output file.’” *Id.* at 29 (quoting Ex. 1002 ¶ 129 (citing Ex. 1005, 1109)). Petitioner concludes, again quoting from the Creusere Declaration,

“[W]hen using Hsu in the natural and obvious manner for transmitting and receiving compressed files over a network,” it would have been obvious for the decompressor to receive a null data compression type descriptor or data compression type descriptor, as appropriate, so it may decompress the data blocks to produce the original file.

Id. at 30 (quoting Ex. 1002 ¶ 126).

Turning to claim 18, Hsu discloses “four basic algorithms used by the system: arithmetic coding, Lempel-Ziv, run length encoding (RLE), and JPEG for image/graphics compression.” Ex. 1005, 1106 (internal citations omitted). Relying on the Creusere Declaration, Petitioner argues “[a]rithmetic coding, Lempel-Ziv, and run-length encoding are all forms of lossless encoding.” Pet. 30 (citing Ex. 1002 ¶134); *see also* Ex. 1001, 15:9–13 (acknowledging known lossless encoding techniques).

(2)Patent Owner’s Argument and Supporting Evidence

Patent Owner argues the Petitioner has failed to articulate the differences between the prior art and claims 17 and 18. Pet. 36–37. Patent Owner specifically argues that “Ground 2 never acknowledges that Hsu lacks either of the two transmitting limitations, urges that both are disclosed by using Hsu in an obvious manner, and then finally suggests modifying Hsu to teach only one of them.” *Id.* at 37.

As to claim 18, Patent Owner argues the Petition and Dr. Creusere relies on four compression algorithms or encoders. PO Resp. 31–32 (citing Pet. 17 (citing Ex. 1005, 1103); Ex. 1002 ¶ 93; Ex. 2002, 84:13–18. According to Patent Owner, one of the compression algorithms, JPEG, is not lossless and thus not “all” of the several encoders are lossless. PO Resp. 30–31, 33 (citing Ex. 2002, 96:5–15 (Dr. Creusere agreeing JPEG is “a lossy

form of compression”); *see also* Tr. 35:23 (“claim 18 clearly requires that all of the encoders be lossless.”).

(3) Discussion

Petitioner has provided through the Creusere Declaration paragraph 126 a rational basis for a person of ordinary skill in the art to conclude the compressed or uncompressed block is received as recited in claim 17. Patent Owner argues only one of the “transmitting” steps is argued as shown in Hsu, “transmitting said null data compression type descriptor.” PO Resp. 37. Even if only one of the alternatives is taught, under *Schulhauser*, the conditional limitation of claim 17 is shown.

We are not persuaded that claim 18 should be construed to require that “all” of the recited “several encoders” are lossless. We proceed on the plain and ordinary meaning of the term without express construction. We do not see any basis to read the term “said several encoders are lossless encoders” to require that *all*, as opposed to more than one, i.e., “several,” of the encoders are lossless. Patent Owner argues for its “all” meaning by noting that “claim 35 requires only that ‘**at least one** of said several encoders is lossless.’” PO Resp. 31 (citing *Karlin Tech. v. Surgical Dynamics, Inc.*, 177 F.3d 968, 971–72 (Fed. Cir. 1999) (referring to “the common sense notion that different words or phrases used in separate claims are presumed to indicate that the claims have different meanings and scope”)). Patent Owner does not explain how *Karlin*’s holding applies here when the plain and ordinary meaning of “several” differs from “at least one.”

Neither are we persuaded that Petitioner has failed to identify the differences between claims 17 or 18 and Hsu. PO Resp. 36–37. Petitioner argues Hsu “renders obvious the additional limitations of claim 17” and

“further discloses the additional limitation of claim 18.” Pet. 25 (claim 17), 30 (claim 18). That the specific limitation of claims 17 and 18 is the difference for which Hsu is relied on, is corroborated by the statements regarding alternative Ground 5 for claims 17 and 18, where Franaszek is relied on instead of Hsu alone. *Id.* at 49–50 (for claim 17 “[t]o the extent it can be contended that Hsu does not disclose the ‘transmitting’ and/ or ‘receiving’ limitations of claim 17, these requirements are rendered obvious by Hsu in view of Franaszek”).

b. Summary of Obviousness over Hsu (claims 17 and 18)

Petitioner has shown by a preponderance of the evidence that claims 17 and 18 would have been obvious over Hsu. Specifically, we credit the Creusere Declaration where cited.

4. Obviousness over Franaszek (claims 16–19, 32, 34, and 35)

Petitioner alleges that claims 16–19, 32, 34, and 35 would have been obvious under 35 U.S.C. § 103 over Franaszek. Pet. 4, 46–49 (Ground 4). This Ground 4 was denied in the Institution Decision but added afterwards. *See* Inst. Cor. Order 2.

Per our Order (Paper 30) Patent Owner was authorized to respond to the newly added grounds by filing a Supplemental Brief. In its Supplemental Brief Patent Owner argues that the recited “null data compression type descriptor” would not be an obvious modification to Franaszek, as Petitioner asserts, based on Franaszek’s teaching of a compression method description (CMD) area. Supp. Br. 2 (citing Pet. 46–47). According to Patent Owner, this argument is the same one made by Petitioner in connection with Ground 9. *Id.* at 2 (comparing Pet. 47 and Pet. 64–65); *see also* Section III.C.9 below (our analysis of Ground 9). Thus,

Patent Owner repeats its argument relative to Ground 9. *Id.* at 2–3 (quoting PO Resp. 30).

As to *Schulhauser*, Patent Owner argues as it did in Paper 26 that for various reasons *Schulhauser* does not apply. Supp. Br. 5. We found these arguments unpersuasive above in Section III.A.4.

Petitioner argues the present ground as an alternative to Ground 3, anticipation of claims 16–19, 32, 34, and 35 by Franaszek. Pet. 46. Specifically, Petitioner argues that if we were to find that Franaszek “does not disclose the ‘null data compression type descriptor’ required by claims 16 and 17,” we would find the limitation obvious. *Id.*

We have already found claims 16–19, 32, 34, and 35 anticipated by Franaszek in Section III.B.2 above. As discussed, under *Schulhauser*, Franaszek anticipates if one of the conditional limitations is shown. Thus, we need not address whether or not the “null data compression type descriptor” would have been obvious over Franaszek alone. Additional analysis of an obvious ground based on the same reference we found to anticipate the same claims is also unnecessary. *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983) (“anticipation is the epitome of obviousness”).

a. Summary of Obviousness over Franaszek (claims 16–19, 32, 34, and 35)

Under *Schulhauser*, Petitioner has shown by a preponderance of the evidence that claims 16–19, 32, 34, and 35 would have been obvious over Franaszek.

5. Obviousness over Hsu and Franaszek (claims 17, 18, and 32)

Petitioner alleges that claims 17, 18, and 32 would have been obvious under 35 U.S.C. § 103 over Hsu and Franaszek. Pet. 4, 49–54 (Ground 5).

Petitioner argues Ground 5 as an “alternative to Grounds 1 and 2” as it relates to claims 17 and 18. *Id.* at 49. Patent Owner argues claims 17, 18, and 32 are patentable for the same reasons it argued in response to the Hsu obviousness ground. *See* PO Resp. 34–35. In addition, Patent Owner argues the Petition does not allege the differences between claims 17 and 18 and the prior art. PO Resp. 38–39.

Petitioner argues the “transmitting” and “receiving” limitations of claim 17 are taught based on its showing that Franaszek anticipates claim 17, as discussed in Section III.B.2.c above. Pet. 49 (citing Pet. Section VI.C.2 Ground 3), 37–41). For the remaining limitations of claim 17, Petitioner references its showing regarding anticipation by Hsu of claim 16 (Ground 1), with which we agree. *Id.* Accordingly, we are not persuaded that the Petitioner has failed to show the differences between the prior art and, with respect to claim 17.

Petitioner cites to its prior showing that Hsu discloses claim 18. Pet. 49 (citing Pet. Section VI.B.2 (Ground 2), 25–28). We agreed and were not persuaded by Patent Owner’s arguments. *See* Section III.C.3.a above.

Petitioner cites to its prior showing that Hsu discloses claim 32. Pet. 50 (citing Pet. Section VI.B.1 (Ground 1), 22–23 and Section VI.C.5 (Ground 3), 44). We agreed and were not persuaded by Patent Owner’s arguments. *See* Sections III.A.1.c and III.A.2.d above.

We adopt Petitioner’s rationale for combining Hsu and Franaszek. Specifically, we agree with Petitioner that it would have been obvious to a person of skill in the art to combine their teachings because both references: (1) are in the same technical field of data compression (Ex. 1005, 1097; Ex. 1006, Abstract, 1:5–9); (2) teach systems that analyze and compress data in

the form of data blocks (Ex. 1005, 1097, 1102, 1108–09; Ex. 1006, 4:4–5:39, 6:51–7:36, Figs. 1–3, 5, 6; Ex. 1002 ¶ 187); and (3) recognize that certain compression methods (e.g., Lempel-Ziv) optimally compress certain but not all types of data and are directed at the problem of optimally compressing a collection of data blocks containing different types of data (Ex. 1005, 1097–1100, 1106–08; Ex. 1006, 1:22–3:36). Pet. 50. Petitioner, thus, argues that both references recognize the significance of analyzing data blocks to determine data type and identifying the most optimal compression algorithm for at least the most common types of data or certain content. *Id.* at 51 (citing Ex. 1002 ¶¶ 120, 152). Therefore, Petitioner concludes “it would have been obvious to a person of ordinary skill in the art having the benefit of Hsu and Franaszek to modify a data compression system that records compression types to a compression history, such as that provided by Hsu, to transmit compressed data and descriptors between two remote computers as taught in Franaszek.” *Id.* (quoting Ex. 1002 ¶ 121; *see also id.* (citing other reasons for the combination)).

a. Summary of Obviousness over Hsu and Franaszek (claims 17, 18, and 32)

Petitioner has shown by a preponderance of the evidence that claims 17, 18, and 32 would have been obvious over Hsu and Franaszek. Specifically, we credit the Creusere Declaration where cited.

6. Obviousness over Hsu and Langdon, Jr. (claim 19)

Petitioner alleges that claim 19 would have been obvious under 35 U.S.C. § 103 over Hsu and Langdon, Jr. Pet. 4, 54–58 (Ground 6). Patent Owner argues the Petition does not allege what is missing from either

Hsu or Langdon that is recited in claim 19 and does not identify any differences between the prior art and the claim. PO Resp. *Id.* 39.

Claim 19 depends from claim 17 and recites “wherein at least two of said several encoders are in a parallel configuration.” Petitioner cites to Hsu’s disclosure that different compression algorithms can be combined and “[c]omposition can either be accomplished by running several algorithms in succession or by combining the basic algorithms and heuristics to create a new technique.” Pet. 54–55 (citing Ex. 1005, 1100). Petition concludes “Hsu contemplates using more than one encoder for any particular file.” *Id.* at 55 (citing Ex. 1002 ¶ 138).

Petitioner cites to Langdon, Jr. to teach a parallel hardware configuration. Pet. 55–56 (citing Ex. 1007, 9:12–18 (multiple encoder units in a compaction system), Fig. 4 (encoders 1, 2 . . . , n in parallel)). Petitioner also references Figure 6 of Langdon, Jr., which teaches “compaction processors CP1–CP4” that “are used in parallel to achieve an approximate five megabyte data transfer rate” for both encoding and decoding. Pet. 57 (quoting Ex. 1007, 13:62–65); *see also* Ex. 1007, 8:55–61 (“Each CP added in parallel, permits an additional 1.25 mega bytes per second encoding and decoding rate, thus increasing the data processing rate.”).

Petitioner asserts that a person having ordinary skill in the art would have recognized that, where Hsu teaches the benefits of multiple encoders and “composite techniques,” a benefit would exist for “arrang[ing] the encoders to operate in parallel in the manner described in Langdon, Jr.” Pet. 57 (citing Ex. 1002 ¶ 143). We agree and adopt several of Petitioner’s reasons for making the combination, including that “the parallel configuration of encoders provides higher efficiency and

compression/decompression rates, as explained in Langdon, Jr.” *Id.* (quoting Ex. 1002 ¶ 143). In addition, Petitioner argues a parallel arrangement is one of “a finite number of predicable [sic] solutions” for organizing the encoders. *Id.* at 57–58 (citing Ex. 1002 ¶ 143). Petitioner also argues “Hsu and Langdon, Jr. both use arithmetic coders and both are attempting to improve the efficiency of file storage systems.” *Id.* at 58 (citing Ex. 1002 ¶ 144).

We are persuaded that Petitioner has shown the differences between claim 19 and the prior art. The Petition states that “Hsu renders claim 17 obvious.” Pet. 54 (citing Pet. Section VI.B.1, 25–30). As to claim 19, i.e., the “difference,” Petitioner cites Langdon, Jr. arguing a person of ordinary skill “would have further understood Hsu in view of Langdon, Jr. to disclose the additional limitation of claim 19.” *Id.* As discussed above, Petitioner cites to Langdon, Jr. to teach a parallel hardware configuration as recited in claim 19. Pet. 55–56

a. Summary of Obviousness over Hsu and Langdon Jr. (claim 19)

Petitioner has shown by a preponderance of the evidence that claim 19 would have been obvious over Hsu and Langdon Jr. Specifically, we credit the Creusere Declaration where cited.

7. Obviousness over Hsu, Franaszek and Langdon, Jr. (claim 19)

Petitioner alleges that claim 19 would have been obvious under 35 U.S.C. § 103 over Hsu, Franaszek, and Langdon, Jr. Pet. 4, 59 (Ground 7). This Ground 7 was denied in the Institution Decision but added afterwards. See Inst. Cor. Order 3. Patent Owner does not argue separately this ground in its Supplemental Brief.

Petitioner argues this ground as an alternative to Ground 6 discussed in Section III.C.6 above and then only to the “extent the Board concludes that Hsu does not disclose the ‘transmitting’ steps of claim 17.” Pet. 59. We concluded above that Hsu does disclose at least one “transmitting” step of claim 17. *See* Sections III.C.3 and III.C.6 above.

Grounds 6 and 7 overlap substantially and Petitioner has shown that the combination of Hsu, Franaszek, and Langdon, Jr. teaches all the limitations of claim 19 and claims 16 and 17 from which it depends. Petitioner references its prior showings regarding rationale for the combination and motivation to combine. Pet. 59 (citing Pet. Section VI.F, 57–58).

a. Summary of Obviousness over Hsu, Franaszek, and Langdon Jr. (claim 19)

Petitioner has shown by a preponderance of the evidence that claim 19 would have been obvious over Hsu, Franaszek, and Langdon Jr. Specifically, we credit the Creusere Declaration where cited.

8. Obviousness over Franaszek and Langdon, Jr. (claims 16–19, 32, 34, and 35)

Petitioner alleges that claims 16–19, 32, 34, and 35 would have been obvious under 35 U.S.C. § 103 over Franaszek and Langdon, Jr. Pet. 4, 59–64 (Ground 8). This Ground 8 was denied in the Institution Decision but added afterwards. *See* Inst. Cor. Order 2. Petitioner asserts this ground as an alternative to Grounds 3 and 4 as to claims 16–19, 32, 34, and 35, “to the extent the Board concludes that Franaszek does not disclose the ‘null data compression type descriptor’ of claims 16 and 17.” Pet. 59. We discussed Ground 3, anticipation by Franaszek, in Section III.A.2 above and Ground 4, obviousness over Franaszek, in Section III.B.3 above.

In its Supplemental Brief Patent Owner argues that the recited “null data compression type descriptor” of claims 16 and 17 would not be an obvious modification to Franaszek, as Petitioner asserts, based on Franaszek’s teaching of a compression method description (CMD) area. Supp. Br. 3 (citing Pet. 63–64). According to Patent Owner, this argument is the same one made by Petitioner in connection with Ground 4 and Ground 9 and should fail for the same reasons. *Id.*; see also Section III.B.4 above and III.B.9 below (respectively our analysis of Grounds 4 and 9).

We have already found claims 16–19, 32, 34, and 35 both anticipated and obvious over Franaszek in Sections III.A.2 (Ground 3) and III.B.4 (Ground 4) above. As discussed, under *Schulhauser*, Franaszek anticipates claim 16 if one of the conditional limitations 16[B] is shown. Thus, we need not again discuss whether or not the “null data compression type descriptor” would have been obvious over Franaszek alone.

Absent the *Schulhauser* precedent then we agree with Petitioner that Langdon, Jr. discloses the “null data compression type restrictor,” which is not shown to be disclosed by Franaszek. Pet. 60–61 (quoting Ex. 1007, 10:46–54 (“The packet flag field 76 contains flags’ . . . including ‘a compaction flag which indicates that the packet data field 76 has been compacted’”; citing Ex. 1007, 11:8–10, 10:44–45, 11:22–27, Fig. 2). Petitioner argues that “[w]hen the packet data is *not compacted*, the packet data field 72 contains the data received from the host starting with the first byte of the packet data field.” *Id.* at 61 (citing Ex. 1007, 10:46–54; Ex. 1002 ¶ 182) (emphasis added).

We adopt Petitioner’s rationale and motivation to combine Franaszek and Langdon, Jr. See Pet. 63–64. Specifically, both references are in the

same field and teach, for example, an arithmetic encoder. Pet. 63 (citing Ex. 1002 ¶ 183; Ex. 1006, Fig. 6 (element 600), 7:15–19; Ex. 1007, 8:50–52). As discussed above, Franaszek has a coding identifier for compressed blocks but does not include one for uncompressed blocks. As a matter of design choice, Petitioner argues that a person of ordinary skill “would have naturally considered Langdon Jr.’s packet flag byte 76 an efficient and obvious design choice to use in Franaszek’s CMD for this purpose,” i.e., identifying uncompressed blocks. *Id.* at 63–64 (citing Ex. 1002 ¶ 183). *Id.* at 63–64. Such a combination “would permit the CMD structure in Franaszek to be used by the decoder in an efficient and predictable manner, whether the data was compressed, or not.” *Id.*

a. Summary of Obviousness over Franaszek and Langdon, Jr. (claims 16–19, 32, 34, and 35)

Petitioner has shown by a preponderance of the evidence that claims 16–19, 32, 34, and 35 would have been obvious over Franaszek and Langdon, Jr. Specifically, we credit the Creusere Declaration where cited.

9. Obviousness over Franaszek and Hsu (claims 16–19, 32, 34, and 35)

Petitioner alleges that claims 16–19, 32, 34, and 35 would have been obvious under 35 U.S.C. § 103 over Franaszek and Hsu. Pet. 5, 64–65 (Ground 9¹²). Petitioner asserts this ground as an alternative to Grounds 3 and 4 as to claims 16–19, 32, 34, and 35, “to the extent the Board concludes that Franaszek does not disclose the required ‘null data compression type

¹² Although both Ground 8 and Ground 9 assert unpatentability based on obviousness over Hsu and Franaszek, we address them separately, as the parties do, to more clearly address the different arguments made as to each.

descriptor’ limitations of claims 16 and 17.” Pet. 64. We discussed Ground 3 in Section III.A.2 above and Ground 4 in Section III.B.4 above.

Patent Owner argues “Franaszek and Hsu cannot meet limitations 16[D2] and [D3] because Petitioner’s theory requires placing information from Hsu into a ‘CMD area’ that Franaszek does not have.” PO Resp. 22–30. As previously discussed, Patent Owner argues *Schulhauser* does not apply to the conditional limitations of claims 16 and 17. See Paper 26. Patent Owner’s arguments were rejected in Section III.A.4 above.

Absent the *Schulhauser* precedent then we agree with Petitioner that Hsu discloses the “null data compression type restrictor,” which is not shown to be disclosed by Franaszek. Pet. 64. Regarding the “null data compression type descriptor” limitation, Petitioner further relies on Hsu for its teaching of this limitation. *Id.* (citing Pet. Section VI.B.1, 25–30); see Section II.A.1.b above.

With respect to motivation to combine, Petitioner contends that it would have been obvious to a person of skill in the art to combine the teachings of Hsu and Franaszek, because both references: (1) are in the same technical field of data compression (Ex. 1005, 1097; Ex. 1006, Abstract, 1:5–9); (2) teach systems that analyze and compress data in the form of data blocks (Ex. 1005, 1097, 1102, 1108–09; Ex. 1006, 4:4–5:39, 6:51–7:36, Figs. 1–3, 5, 6; Ex. 1002 ¶ 187); and (3) recognize that certain compression methods (e.g., Lempel-Ziv) optimally compress certain but not all types of data and are directed at the problem of optimally compressing a collection of data blocks containing different types of data (Ex. 1005, 1097–1100, 1106–08; Ex. 1006, 1:22–3:36). Pet. 64–65. Petitioner, thus, argues that both references recognize the significance of analyzing data blocks to

determine data type and identifying the most optimal compression algorithm for at least the most common types of data or certain content. *Id.* at 65 (citing Ex. Ex. 1002 ¶ 187). Therefore, Petitioner concludes “[i]t would have been obvious to modify the compressor of Franaszek to include the ‘skip instruction’ or ‘no compression’ code of Hsu to indicate that a packet is uncompressed.” Pet. 64 (citing Ex. 1002 ¶ 187).

We have considered Patent Owner’s argument that an uncompressed block in Franaszek has no compression method description (CMD) area and that the combination would therefore not be reasonable to a person of ordinary skill. PO Resp. 23 (citing Ex. 2002, 70:3–8; Ex. 1006, 5:8–45; Ex. 1002 ¶¶ 78–82). We have also reviewed the Zeger Declaration and its factual basis for Dr. Zeger’s opinion at paragraph 45 that “Franaszek does not describe a CMD area where coding information could be stored in data blocks that it determines not to compress.” *See* Ex. 2003 ¶¶ 37–47. Dr. Zeger’s factual basis is repeated in the Patent Owner Response. *See* PO Resp. 23–30.

As summarized above, Patent Owner presents substantial evidence that Franaszek’s CMD area does not code information that a block has not met the threshold for compression and, thus is not compressed. *See also* Pet. Reply 18 (acknowledging Franaszek “does not literally include ‘providing’ and ‘outputting’ a ‘null data compression type descriptor’ as recited in Claim 16[D].”). We have reviewed Dr. Creusere’s testimony that Franaszek must inherently include a CMD area for uncompressed blocks and agree with Patent Owner that the argument is a repeat of Ground 3, anticipation by Franaszek, which we rejected at the institution stage. Inst. Dec. 25; PO Resp. 29–30.

Notwithstanding that there is no CMD for an uncompressed block, the question is would it have been obvious to combine Hsu’s “skip instruction” for an uncompressed block with the other aspects of the claims shown by Franaszek. Pet. 64; Pet. Reply 18; *see also* Section III.A.2 (anticipation by Franaszek applying *Schulhauser*). We agree with Petitioner that the person of ordinary skill would combine the references and use Hsu’s teaching to fill the missing “null data compression type descriptor” limitation to Franaszek as taught by Hsu. *See* Pet. 25–30; *see* Section II.A.1.b above. Patent Owner does not provide either argument or evidence disputing this position.

b. Summary of Obviousness over Franaszek and Hsu (claims 16–19, 32, 34, and 35)

Petitioner has shown by a preponderance of the evidence that claims 16–19, 32, 34, and 35 would have been obvious over Franaszek and Hsu.

10. Obviousness over Franaszek, Hsu and Langdon, Jr. (claim 19)

Petitioner alleges that claim 19 would have been obvious under 35 U.S.C. § 103 over Franaszek, Hsu, and Langdon, Jr. Pet. 5, 65 (Ground 10). This Ground 10 was denied in the Institution Decision but added afterwards. *See* Inst. Cor. Order 3. Petitioner asserts this ground as an alternative to Grounds 3 and 4 as to claims 16–19, 32, 34, and 35, “to the extent the Board finds Franaszek does not disclose the ‘receiving’ or ‘transmitting’ limitations of claim 17, from which claim 19 depends.” Pet. 66. We discussed Ground 3, anticipation by Franaszek, in Section III.B.2 above, and Ground 4, obviousness over Franaszek, in Section III.C.3 above.

Patent Owner does not raise any new arguments regarding this ground but points specifically to its arguments regarding Ground 9. *See* Section III.C.9 above. We found those arguments unpersuasive.

Grounds 3 and 4 overlap substantially with this ground and Petitioner has shown that the combination of Franaszek, Hsu, and Langdon, Jr. teaches all the limitations of claim 19 and claims 16 and 17 from which it depends. Petitioner references its prior showings regarding rationale for the combination and motivation to combine. Pet. 66 (citing Pet. Section VI.I.2 (Ground 9) and VI.H2, 63–64 (Ground 8)). We adopted these showings as discussed in Sections III.C.9 and III.C.8 respectively above.

a. Summary of Obviousness over Franaszek, Hsu, and Langdon, Jr. (claim 19)

Petitioner has shown by a preponderance of the evidence that claim 19 would have been obvious over Franaszek, Hsu, and Langdon, Jr. Specifically, we credit the Creusere Declaration where cited.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, based on a preponderance of the evidence, claims 16–19, 32, 34, and 35 of U.S. Patent No. 7,358,867 B2 have been shown to be unpatentable; and

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

IPR2017-00557
Patent 7,358,867 B2

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