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Paper 35
Date: May 25, 2018

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DELL INC.; EMC CORPORATION; HEWLETT-PACKARD ENTERPRISE CO.; HP ENTERPRISE SERVICES, LLC; TERADATA OPERATIONS, INC.; and VERITAS TECHNOLOGIES, LLC,
Petitioner,

v.

REALTIME DATA LLC,
Patent Owner.

Case IPR2017-00176[1]
Patent 7,161,506 C2

Before JASON J. CHUNG, SCOTT C. MOORE, and SHEILA F. MCSHANE, *Administrative Patent Judges*.

CHUNG, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
Inter Partes Review
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

[1] Case IPR2017-00806 has been consolidated with IPR2017-00176. Case IPR2017-01688 has been joined with IPR2017-00176.

I. INTRODUCTION

Dell Inc., EMC Corporation, Hewlett-Packard Enterprise Co., and HP Enterprise Services, LLC (collectively "Petitioner")[2] filed a Petition to institute an *inter partes* review of claims 104 and 105 of U.S. Patent No. 7,161,506 C2 ("the '506 patent"). Paper 1 ("Pet."). Realtime Data LLC ("Patent Owner") filed a Preliminary Response pursuant to 35 U.S.C. § 313. Paper 15 ("Prelim. Resp.").

Upon consideration of the Petition and the Preliminary Response, on November 4, 2016, we instituted *inter partes* review of claims 104 and 105 ("instituted claims"), pursuant to 35 U.S.C. § 314. Paper 19 ("Dec.").

On January 30, 2017, Teradata Operations, Inc. ("Teradata") filed a second Petition. *See* IPR2017-00806, Paper 1, 1. The IPR2017-00806 Petition was substantially similar to the Petition in IPR2017-00176. On September 8, 2017, we entered an order consolidating and coordinating Teradata's IPR2017-00806 proceeding with IPR2017-00176. IPR2017-00176, Paper 28 ("Consolidation Order"). The Consolidation Order provided that IPR2017-00176 and IPR2017-00806 would proceed on the same schedule, that Patent Owner would file one common Patent Owner Response in both proceedings, that the petitioners would file one common Reply for both proceedings, that the parties would file copies of all exhibits in both proceedings, and that the August 4, 2017 Deposition of Charles D.

[2] The other named petitioners were named in the consolidated and joined cases. *See supra* n.1. Although consolidated IPR2017-00806 remains a separate proceeding from the other joined proceedings, the portions of each Petition that we relied on are substantively identical. For purposes of this Decision, we refer to the Paper numbers in IPR2017-00176. The parties are not permitted to use this caption.

Creusere, Ph.D (Ex. 2003) and any future depositions would be treated as having been taken in both proceedings. Consolidation Order 4–5.

On June 28, 2017, Veritas Technologies LLC ("Veritas") filed a third Petition. *See* IPR2017-01688, Paper 1, 1. The IPR2017-01688 Petition was substantively identical to the Petition in IPR2017-00176 Petition, and was accompanied by a motion asking that Veritas be joined as a party to the parties in IPR2017-00176. IPR2017-01688, Paper 3. Patent Owner Realtime Data LLC did not file a Preliminary Response.

On November 21, 2017, we granted Veritas' Motion for Joinder, ordering that Veritas be joined as a petitioner in IPR2017-00176, that the grounds of unpatentability asserted in IPR2017-00176 remain unchanged, that all future filings be made in IPR2017-00176, and that IPR2017-01688 be terminated as a separate proceeding. IPR2017-01688, Paper 11, 8. Therefore, the filings and evidence in IPR2017-00176 govern the claims raised by Veritas in IPR2017-01688, and this Decision does not cite separately to filings or evidence in the IPR2017-01688.

On September 22, 2017, Patent Owner filed a Patent Owner Response (Paper 30 ("PO Resp.")), which was accompanied by a supporting declaration from Kenneth A. Zeger, Ph.D (Ex. 2004). Petitioner filed a Reply to Patent Owner's Response on December 6, 2017. Paper 34 ("Reply").

An oral hearing was held on February 20, 2018, and a transcript of the oral hearing is available in the record. Paper 41 ("Tr."). Because Petitioner raised a claim construction issue in its Reply (*see* Reply 20–23) about whether claims 104 and 105 include conditional limitations that should not be given patentable weight pursuant to *Ex Parte Schulhauser*, 2016 WL

6277792, No. 2013-007847 (PTAB 2016) (precedential) (hereinafter, "*Schulhauser*"), we authorized five pages of concurrent additional briefing for each party on this issue. Paper 38 (hereinafter, "Additional Briefing"). In response, Patent Owner filed additional briefing (Paper 39, "PO Br.") and Petitioner filed additional briefing (Paper 40, "Pet. Br.").

On May 15, 2018, the Board issued an order pursuant to the parties' written consent modifying the Institution Decisions in the IPR2017-00176, IPR2017-00806, and IPR2017-01688 IPR, so that those decisions institute review of all challenged claims on all grounds presented in the corresponding petitions. Paper 42 (citing Exs. 3001–3006). By consent of the parties, this Decision addresses all claims and all grounds raised in the petitions. *See id.*

We issue this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed herein, Petitioner has shown by a preponderance of the evidence that claims 104 and 105 of the '506 patent are unpatentable. *See* 35 U.S.C. § 316(e).

A. Related Matters

Petitioner and Patent Owner inform us that the '506 patent is involved in multiple suits in the U.S. District Court and the U.S. Court of Appeals for the Federal Circuit. Pet. 4; Paper 6, 4–8; Paper 12, 4–8; Paper 14, 2–3; Paper 18, 3–5; Paper 24, 5–8. The parties also inform us that the '506 patent is involved in several *Inter Partes* Review proceedings. Pet. 4; Paper 6, 2–4; Paper 8, 2–4; Paper 12, 2–4; Paper 18, 1–3; Paper 24, 1–5.

B. The Instituted Grounds

References[3]	Basis	Instituted Claims
Franaszek[4] and Hsu[5,6]	§ 103(a)[7]	104 and 105
Franaszek, Hsu and Sebastian[8]	§ 103(a)	104 and 105

C. The '506 Patent

The '506 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, Abst. The '506 patent further describes the input data type includes a plurality of disparate data types. *Id.*

D. The Instituted Claims

We instituted *inter partes* review of claims 104 and 105. Claims 104 and 105 recite essentially similar limitations. Claims 104 and 105 are illustrative and reproduced below:

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[3] Petitioner also relies upon the Declaration of Dr. Charles D. Creusere. Ex. 1002. The portions of Dr. Creusere's declaration that we relied on are substantively identical in all three IPRs listed in footnote 1.
[4] U.S. Patent No. 5,870,036 (filed Feb. 24, 1995) (issued Feb. 9, 1999) (Ex. 1004, "Franaszek").
[5] W. H. Hsu and A. E. Zwarico, "Automatic Synthesis of Compression Techniques for Heterogeneous Files," *Software—Practice and Experience*, Vol. 25(10), 1097–1116 (1995) (Ex. 1005, "Hsu").
[6] Petitioner contends that Hsu was prior art as of 1995. Pet. 13 (citing Ex. 1026 ¶ 35). Patent Owner does not dispute the public availability date. We accept Petitioner's contention. *See* Paper 20, § B.1.b
[7] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), revised 35 U.S.C. § 103, effective March 16, 2013. The '908 patent was issued prior to the effective date of the AIA. Thus, we apply the pre-AIA version of § 103.
[8] U.S. Patent No. 6,253,264 B1 (filed Mar. 6, 1998) (issued June 26, 2001) (Ex. 1030, "Sebastian").

> 104. A computer implemented method for compressing data, comprising:
>
> analyzing data within a data block of an input data stream to identify one or more data types of the data block, the input data stream comprising a plurality of disparate data types;
>
> performing content dependent data compression with a content dependent data compression encoder if a data type of the data block is identified; and
>
> performing data compression with a single data compression encoder, if a data type of the data block is not identified;
>
> wherein the analyzing of the data within the data block to identify one or more data types excludes analyzing based only on a descriptor that is indicative of the data type of the data within the data block.

Ex. 1001, 6:34–49.

> 105. A computer implemented method comprising:
>
> receiving a data block in an uncompressed form, said data block being included in a data stream;
>
> analyzing data within the data block to determine a type of said data block; and
>
> compressing said data block to provide a compressed data block;
>
> wherein if one or more encoders are associated to said type, compressing said data block with at least one of said one or more encoders, otherwise compressing said data block with a default data compression encoder, and
>
> wherein the analyzing of the data within the data block to identify one or more data types excludes analyzing based only on a descriptor that is indicative of the data type of the data within the data block.

Id. at 6:50–64.

II. ANALYSIS

A. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103(a) if "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations.[9] *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966).

"A determination of whether a patent claim is invalid as obvious under § 103 requires consideration of all four *Graham* factors, and it is error to reach a conclusion of obviousness until all those factors are considered." *Apple v. Samsung Elecs. Co., Ltd.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc) (citations omitted). "This requirement is in recognition of the fact that each of the *Graham* factors helps inform the ultimate obviousness determination." *Id.*

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review

[9] Patent Owner has not raised arguments or produced evidence of secondary considerations in this proceeding.

petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner cannot satisfy its burden of proving obviousness by employing "mere conclusory statements." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

Thus, to prevail in an *inter partes* review, Petitioner must explain how the proposed combinations of prior art would have rendered the challenged claims unpatentable. At this final stage, we determine whether a preponderance of the evidence of record shows that the challenged claims would have been obvious over the proposed combinations of the teachings of prior art references.

We analyze the instituted grounds of unpatentability in accordance with the above-stated principles.

B. Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (internal quotation and citation omitted). In that regard, Petitioner's declarant, Dr. Creusere, testifies that a person with ordinary skill in the art at the time of the invention

> would have a minimum of: (i) a bachelor's degree in computer science, computer engineering, electrical and computer

> engineering, electrical engineering, or electronics; and (ii) at least two years of experience working with data compression or a graduate degree focusing in the field of data compression. Such experience would have led to familiarity with data compression systems in general and, more specifically, data compression and decompression techniques associated with various data types. As such, individuals with additional education or additional industrial experience could still be of ordinary skill in the art if that additional aspect compensates for a deficit in one of the other aspects of the requirements stated above.

Ex. 1002 ¶ 26.

Patent Owner's Declarant Dr. Kenneth A. Zeger, Ph.D., does not disagree with Petitioner's statements regarding the level of ordinary skill in the art. Ex. 2005 ¶ 20. Based on our review of the '506 patent, the types of problems and solutions described in the '506 patent and cited prior art, and the testimony of Dr. Creusere and Dr. Zeger, we adopt and apply Dr. Creusere's definition of a person of ordinary skill in the art at the time of the claimed invention for purposes of this Decision.

C. Claim Construction

1. Determining Whether it is Appropriate To Apply Schulhauser to the Present Case

Patent Owner argues Petitioner did not present timely any argument or theory based on *Schulhauser*, and has waived the ability to present these arguments. Patent Owner argues the Board is legally foreclosed from now finding unpatentability based on *Schulhauser sua sponte*. PO Br. 1–2 (citing *Intelligent Bio-Sytems, 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. Continental Auto. Systems*, 853 F.3d 1272, 1286 (Fed. Cir. 2017); *Ariosa Diagnostics v. Verinata*

Health, Inc., 805 F.3d 1359, 1367 (Fed. Cir. 2015); 5 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 predates the Petition, but the Petition did not raise this issue. Moreover, Patent Owner argues it did not have a full and fair opportunity to develop responsive evidence or argument. PO Br. 2.

Additionally, Patent Owner argues applying *Schulhauser* in the context of this proceeding would be arbitrary and capricious, and unconstitutional. PO Br. 2. Patent Owner explains the *Schulhauser* decision arose in the context of a pending prosecution. 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 during reexamination of the '506 patent, the Office gave the limitations at issue patentable weight. *Id.* (citing Ex. 1007, 27–28, 32–33, 35; Ex. 1012, 27–28). 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, 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 Products 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. PO Br. 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. Hospital*, 488 U.S. 204, 208–09 (1988)). And 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 it of the weight that the Office once afforded to its issued claim limitations 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) (hereinafter, "*Applera*"). PO Br. 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 further argues *Schulhauser's* quotes from *Cybersettle v. Nat'l Arbitration Forum*, are misplaced. PO Br. 4 (citing 243 F.App'x 603, 607 (Fed. Cir. 2007)). 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. Moreover, we find that each of the cases cited by Patent Owner is factually distinguishable from *Schulhauser*.

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."). Because this issue concerns claim construction, we conclude the best course of action under these specific circumstances is to follow our Tribunal'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.[10] Additional Briefing 1–2. In summary, *Schulhauser* is our precedent and it should apply given its potential applicability to the claim construction for the claims at issue.

Patent Owner's argument that *Schulhauser* arose in the context of prosecution, such that a patentee could have worked around *Schulhauser* by simply amending claims to avoid limitations that would not be given

[10] Patent Owner did not identify any Federal Circuit cases that overruled *Schulhauser*. *See generally* PO Br. 3–5. Petitioner relied on a related Board case. Pet. Br. 3–4 (citing *Reactive Surfaces LTD., LLP, v. Toyota Motor Corp.*, IPR2016-01914, Paper 60 (PTAB Jan. 12, 2018) (hereinafter, "*Reactive*")). 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*.

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. Nothing in *Schulhauser* explicitly or implicitly limits its holding only to prosecution.

We note Patent Owner's statement that in the present case, *Schulhauser* was only raised by Petitioner after the time to bring a motion to amend had passed. PO Br. 2–3. To the extent that Patent Owner is suggesting that it was deprived of the opportunity to file a motion to amend, we disagree because Patent Owner should have been aware of *Schulhauser* since at least the filing of Petitioner's Reply (i.e., December 5, 2017). Yet, Patent Owner's additional briefing filed on March 5, 2018 was the first and only time Patent Owner made reference to a motion to amend. PO Br. 2–3. Although the time to file a motion to amend, under the Scheduling Order, had passed when Petitioner filed its Reply, Patent Owner was free to seek leave to file a late motion to amend. However, Patent Owner did not contact the Board on this issue.[11]

We, therefore, find that it is appropriate to apply *Schulhauser* in the context of this proceeding for at least the reasons explained *supra*.[12]

2. Construing Claims 104 and 105 in view of Schulhauser

Claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in

[11] The motion to amend due date is not a statutory deadline; as a result, it can be adjusted by the panel.

[12] We considered and overrule Patent Owner's objection (Tr. 38:7–42:7) for at least the reasons stated *supra* in § II.C.1.

which they appear. 37 C.F.R. § 42.100(b). Under that standard, and absent any special definitions, we give claim terms their ordinary and customary meaning, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Because we find that it is appropriate to apply *Schulhauser* to the present case for at least the reasons stated *supra* in § II.C.1., we construe claims 104 and 105 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 method claim 1, **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 electro cardiac 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, claim 104 of the present case recites "performing content dependent data compression with a content dependent data compression encoder if a data type of the data block is identified" (hereinafter, "if A, then perform step X limitation of claim 104") and "performing data compression with a single data compression encoder, if a data type of the data block is not identified" (hereinafter, "if not A, then perform step Y limitation of claim 104"). Ex. 1001, 2:34–45. Also, claim 105 recites "wherein if one or more encoders are associated to said type,

compressing said data block with at least one of said one or more encoders" (hereinafter, "if A, then perform step X limitation of claim 105") and "otherwise compressing said data block with a default data compression encoder" (hereinafter, "if not A, then perform step Y limitation of claim 105"). *Id.* at 2:57–60. Therefore, as a matter of law, we determine **only one condition** needs to be satisfied in the prior art to render the claim anticipated or obvious.

Patent Owner argues the broadest reasonable construction in light of the specification weighs against construing the claims in this manner. PO Br. 4 (citing Ex. 1001, 2:54–3:45). Patent Owner further argues the Specification teaches methods "for providing fast and efficient data compression using a combination of content independent data compression and content dependent data compression." *Id.* Patent Owner argues interpreting claims 104 and 105 to be met based on a content dependent approach only (i.e., ignoring "performing data compression with a single data compression encoder, if a data type of the data block is not identified" recited in claim 104 and "otherwise compressing said data block with a default data compression encoder" recited in claim 105) would be exactly what the Specification teaches against and cannot be correct under the broadest reasonable interpretation standard. *Id.* at 4–5. We disagree.

The Background of the Specification describes "limitations" with using content dependent compression, 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 Sofarmor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009).

Moreover, even if the broadest reasonable construction in light of the specification were not dictated by *Schulhauser*, construing claims 104 and 105 based on the Specification would have led to the same construction. For example, without considering *Schulhauser*, Figures 14A–D illustrates an example teaching of a logical path through the flow chart that uses only content dependent compression. Ex. 1001, Fig. 14A–D. That is, if we follow the 'YES' branch at decision 1408 and the 'YES' branch at decision 1448, then the compression method is completed using only content dependent compression. *Id.* In addition, there is **no** requirement in the Specification that the path through Figure 14 **must** follow both the 'YES' branch at decision 1408 and the 'NO' branch at decision 1408. *Id.*; *see generally* Ex. 1001. Because 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 content dependent compression (*id.* at Figs. 14A–D), then the Specification cannot be said to teach against using only content dependent compression. Figures 16A–D and Figures 18A–D also illustrate example teachings of a logical path through the flow chart that uses only content dependent compression. Ex. 1001, Fig. 16A–D, 18A–D.

Lastly, Patent Owner argues the only expert testimony of record demonstrates that all of the limitations of claims 104 and 105 must be met under Petitioner's obviousness theory, or else obviousness cannot be found. *Id.* (citing Ex. 2004 ¶¶ 32–38). However, the application of *Schulhauser* is a claim construction issue, which is a matter of law. Although witness testimony may be used when "'technical terms are used, or where the qualities of substances . . . or any similar data necessary to the

comprehension of the language of the patent are unknown to the judge,'" a court, when construing a patent, "'proceeds upon its own responsibility, as an arbiter of the law, giving to the patent its true and final character and force.'" *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 388 (quoting 2 W. Robinson, Law of Patents § 732, pp. 482–483 (1890); emphasis in original); *see also* 37 C.F.R. § 42.65(a) ("Testimony on United States patent law or patent examination practice will not be admitted.").

We determine that no other terms require express construction for purposes of this Decision. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (only those claim terms or phrases that are in controversy need to be construed, and only to the extent necessary to resolve the controversy).

D. Alleged Obviousness of Independent Claims 104 and 105

1. The Prior Art

a. Overview of Franaszek (Ex. 1004)

Franaszek relates to systems and methods for compressing and decompressing data blocks using a plurality of optimal encoders. Ex. 1004, at [57]. In Franaszek, representative samples of each block are tested to select an appropriate encoder for the block. *Id.* The data type of incoming data blocks is recognized, and the collection of data blocks are compressed using a plurality of optimal encoders for the different types of data. *Id*. at 4:30–36, 5:49–53. Figure 2 of Franaszek is reproduced below and depicts one embodiment of the Franaszek system.

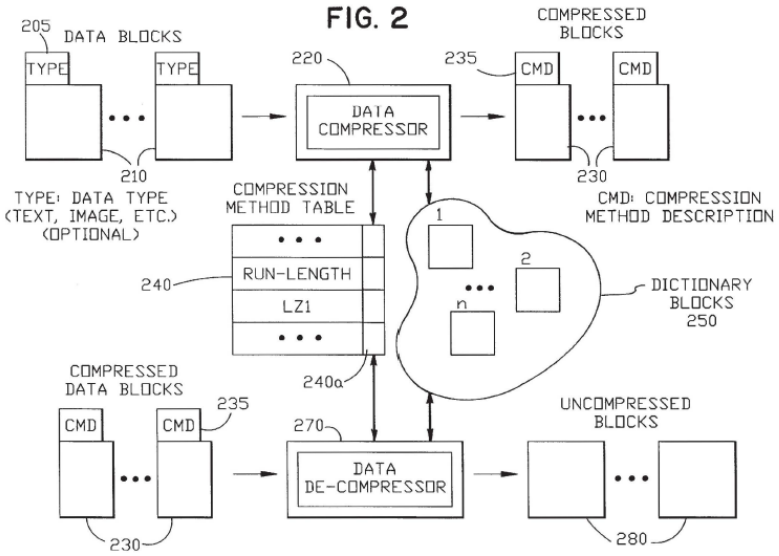


Figure 2 illustrates data compressor 220 and data de-compressor 270, with uncompressed data blocks 210 that may contain type information 205. *Id*. at 4:25–31. According to Franaszek, the type information, for example, may be image data encoded in a given format, source code for a given programming language, etc. *Id*. at 4:32–34. Data blocks 210 are input to data compressor 220. Data compressor 220 and data de-compressor 270 share compression method table 240 and memory 250 containing a number of dictionary blocks. *Id*. at 4:34–38. Data compressor 220 selects a compression method to compress the data. *Id*. at 4:52–53. Data compressor 220 outputs compressed data blocks 230, each with compression method description ("CMD") 235 that encodes an index identifying the selected compression method for that block. *Id*. at 4:55–57. De-compressor 270 de-compresses the block using the specified method found in compression method table 240 (using the compression method identifier as an index), and outputs uncompressed data blocks 280. *Id*. at 5:1–7.

b. Overview of Hsu (Ex. 1005)

Hsu is titled "Automatic Synthesis of Compression Techniques for

Heterogeneous Files," and discloses systems and methods for compressing "heterogeneous files"—files that contain "multiple types of data such as text, images, binary, audio, or animation." Ex. 1005, Title, 1097. Hsu teaches a heterogeneous compressor that automatically chooses the best compression algorithm to use on a given variable-length block of a file, based on both the qualitative and quantitative properties of that segment, and "treats a file as a collection of fixed size blocks (5K in the current implementation), each containing a potentially different type of data and thus best compressed using different algorithms." *Id.* at 1102. Hsu further teaches a two phase system. *Id.* In the first phase, the system uses statistical methods based on analysis of the data within each block to determine a data type of the block and to determine the optimal encoder to use in compressing a block. *Id.* at 1097; *see also id.* at 1103 ("The compressibility of a block of data and the appropriate algorithm to do so are determined by the type of data contained in a block . . . ."). 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. In this optimization, which is interleaved with the actual compression, adjacent blocks for which exactly the same method have been chosen are merged into a single block. *Id.* at 1102. Specifically, during the second phase, the heterogeneous compressor applies the selected algorithms to the blocks separately. *Id.* at 1098.

The approach in Hsu uses a program synthesis technique, meaning that a compression plan, consisting of instructions for each block of input data, is generated based on the statistical properties of the input data. *Id.* According to Hsu, its system chooses each algorithm (as well as the duration of its applicability) before compression begins, rather than modifying the

technique for each file during compression. *Id.* at 1100. The heterogeneous compressor in Hsu bases its compression upon statistics gathered from larger blocks of five kilobytes. *Id.* Hsu states that "[t]his allows us to handle much larger changes in file redundancy types. This makes our system less sensitive to residual statistical fluctuations from different parts of a file." *Id.* Hsu further teaches that "in-depth statistical analysis in order to make a more informed selection from the database of algorithms" when looking at the blocks of data to be compressed, and such computations are considered for an entire block (as opposed to sporadic or random sampling from parts of each block). *Id.* at 1101.

Hsu discloses that the compressibility of a block of data and the appropriate algorithm to do so are determined by the type of data contained in a block and the type of redundancy (if any) in the data. *Id.* at 1103. These two properties are represented by four parameters: the block type, and the three redundancy metrics. *Id.* The block type describes the nature of a segment of input data. *Id.* The redundancy metrics are quantitative measures that are used to determine the compressibility of a block of data. They are: the degree of variation in character frequency or alphabetic distribution, M_{AD}; the average run length of the block, M_{RL}; and the string repetition ratio of the block, M_{SR}. *Id.* at 1104. According to Hsu, these three manifestations of redundancy are independent, and each of the redundancy types is exploited by different compression algorithms. *Id.*
The compression algorithms and attendant heuristics of Hsu are organized into the 10 by 3 table shown Table 1, reproduced below.

	M_{AD}	M_{RL}	M_{SR}
ANSI	arithmetic coding	run-length encoding	Lempel–Ziv
	*	byte-wise encoding	freeze
hexadecimal	arithmetic coding	run-length encoding	Lempel–Ziv
	*	n-bit run count	freeze
natural language	arithmetic coding	*	Lempel–Ziv
	*	*	freeze
source code	arithmetic coding	run-length encoding	Lempel–Ziv
	*	n-bit run count	freeze
low redundancy	*	run-length encoding	Lempel–Ziv
binary	*	n-bit run count	*
audio	*	run-length encoding	Lempel–Ziv
	*	byte-wise encoding	freeze
low resolution	*	run-length encoding	Lempel–Ziv
graphic	*	n-bit run count	freeze
high resolution	JPEG	run-length encoding	JPEG
color graphic	improved Huffman	n-bit run count	improved Huffman
high redundancy	arithmetic coding	run-length encoding	Lempel–Ziv
binary	*	n-bit run count	freeze
object	arithmetic coding	run-length encoding	Lempel–Ziv
	*	byte-wise encoding	freeze

As shown in Table 1, the 10 file descriptors are the row indices and the 3 metrics are the column indices. *Id.* at 1106. Each entry of the table contains descriptors that are used to access the code for an algorithm-heuristic pair. *Id.* Hsu teaches the use of four basic compression algorithms to be used in its system: arithmetic coding, Lempel-Ziv, run length encoding (RLE), and JPEG for image/graphics compression. *Id.* An optimal algorithm is selected for each data block of a file, and the system creates a record of each data block and its optimal algorithm, which Hsu refers to as the file's "compression plan." *Id.* at 1109. Hsu notes that "recent implementations of 'universal' compression programs execute the Lempel-Ziv algorithm and dynamic Huffman coding in succession, thus improving performance by combining the string repetition-based compression of Lempel-Ziv with the frequency based compression strategy of dynamic Huffman coding." *Id.* at 1100.

c. Overview of Sebastian (Ex. 1030)

Sebastian teaches a preferred coding network that integrates format-specific compression into a general purpose compression tool that serves a

wide range of data formats. Ex. 1030, Abst., 1:45–50. Sebastian teaches that source data is parsed into block of similar data and each parsed block is compressed using a respectively selected compression algorithm. *Id*. at Abstr. According to Sebastian, the algorithm can be chosen from a static model of the data or it can be adaptive to the data in the parsed block. *Id.* Sebastian teaches that the parsed blocks are then combined into an encoded data file. *Id.*

In one embodiment, Sebastian teaches a system with different "filters" that each support a specific "data format," such as for Excel XLS worksheets or Word DOC files. *Id.* at 1:50–51. If an installed filter "matches the format of the data to be encoded, the advantages of format-specific compression can be realized for that data." *Id.* at 1:55–57. Otherwise, a "generic" filter is used which achieves performance similar to other non-specific data compression systems (such as PKZip, Stacker, etc.). *Id.* at 1:58–60; *see also id.* at 4:9–23 (other suitable generic filters include those similar to Lempel-Ziv (LZ) variants).

Sebastian also discloses an embodiment with a preferred encoder using a Base-Filter-Resource (BFR) network, which is shown in Figure 2, reproduced below.

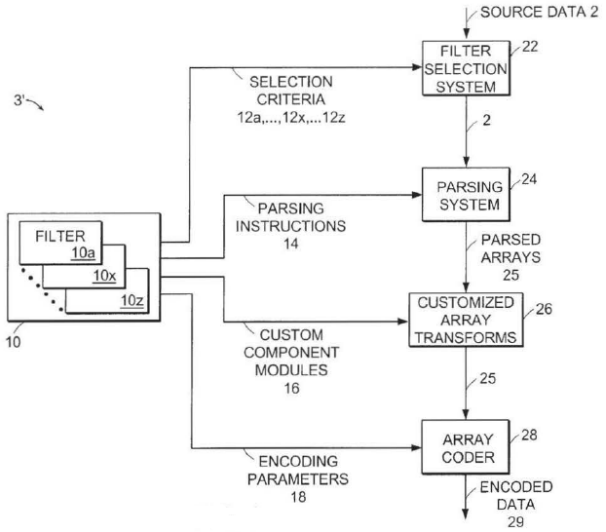


Figure 2 illustrates that encoder 3' is based on the use of a plurality of filters 10*a*, . . , 10*x*, . . , 10*z* which serve specific file formats. *See id.* at 4:1–3. According to Sebastian, one filter 10*a* may support several versions of the DBF database format, while another filter 10*z* may support several versions of the DOC format used by the Microsoft Word software program. *Id.* at 4:3–6. Sebastian teaches that the individual filters provide respective selection criteria 12 to filter selection system 22, which receives source data 2 and checks the selection criteria 12a, . . , 12x, . . , 12z of all filters 10a, . . , 10*x*, . . , 10z installed in the system to see if any of them support the source data's format. *Id.* at 4:6–12. If the specific filters do not, then a "generic" filter is used, which provides compression performance similar to other generic compression systems, such as Lempel-Ziv (LZ) engines. *Id.* at 4:12–15. Sebastian then teaches that in a particular preferred embodiment of the invention, the generic compression system would use an SZIP compression engine. *Id.* at 4:15–17.

2. Claim 104

a. Analysis Overview

The applicable law is discussed *supra* in § II.A. And as explained *supra* in § II.C., we need not consider whether both conditional limitations of claim 104 are met; that is, Petitioner only needs to show sufficiently that one of the following limitations is met: (1) the if A, then perform step X limitation of claim 104; and (2) the if not A, then perform step Y limitation of claim 104.

We, therefore, focus on the parties' arguments pertaining to whether: (1) the combination of Franaszek and Hsu teaches the if A, then perform step X limitation of claim 104; and (2) a person having ordinary skill in the art at the time of the invention (hereinafter, "PHOSITA") would have combined Franaszek and Hsu so as to arrive at the claimed invention. In the event that we determine elements (1) and (2) of the immediate preceding sentence are fulfilled sufficiently, then we need not determine whether the cited prior art teaches the if not A, then perform step Y limitation of claim 104 for the reasons discussed *supra* in § II.C. We, therefore, also find that if both elements from the first sentence of this paragraph are fulfilled sufficiently, our conclusion will apply to both of Petitioner's grounds (i.e., (1) Franaszek and Hsu; and (2) Franaszek, Hsu, and Sebastian).[13] Because

[13] In both grounds, Petitioner asserts that Franaszek and Hsu (without Sebastian) teach or suggest the if A, then perform step X limitation of claim 104. Pet. 20–24; *see e.g.*, PO Resp. 7–12 (We refer to Patent Owner's headings III.B and III.C. and its discussions associated with those headings.). We, therefore, are not persuaded by Patent Owner's arguments pertaining to the Board instituting on only Franaszek, Hsu, and Sebastian. PO Br. 5 (citing PO Resp. 15–19).

Petitioner has the burden of proof (*see* 35 U.S.C. § 316(e), 37 C.F.R. § 42.20(c)), we begin with Petitioner's arguments.

b. Petitioner Argues the Prior Art Teaches the Limitations Recited in Claim 104

Petitioner asserts that the subject matter of claim 104 would have been obvious in view of Franaszek and Hsu under 35 U.S.C. § 103(a). Pet. 14–36. In particular, Petitioner explains where each limitation of claim 104 is taught in Franaszek and Hsu. *Id.*

Petitioner argues Franaszek teaches if a data type (e.g., text, image, etc.) for an uncompressed block is available, the compression method list (hereinafter, "CML") is set to a list of compression methods that have been preselected for that data type, which Petitioner maps to the limitation "performing content dependent data compression with a content dependent data compression encoder if a data type of the data block is identified" recited in claim 104. *Id.* at 18, 20–21, 23–24 (citing Ex. 1004, 5:49–53; Ex. 1002 ¶¶ 98–99, 108–109).

Petitioner argues Hsu teaches that a "'heterogeneous compressor 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 19, 37–38 (quoting Ex. 1005, 1102). And Petitioner argues Hsu teaches "[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," which Petitioner maps to the limitation "performing content dependent data compression with a content dependent data compression encoder if a data

type of the data block is identified" recited in claim 104. *Id.* at 21–22 (citing Ex. 1005, 1103; Ex. 1002 ¶¶ 100, 102–104).

Furthermore, Petitioner argues Hsu teaches analyzing samples of bytes located at the first, middle, and end portions of data blocks to determine a file type, which Petitioner maps to the limitation "wherein the analyzing of the data within the data block to identify one or more data types excludes analyzing based only on a descriptor that is indicative of the data type of the data within the data block" as recited in claim 104. *Id.* at 31–33 (citing Ex. 1005, 1102, 1104; Ex. 1002 ¶¶ 65–66).

According to Petitioner, a PHOSITA would have been motivated to combine Franaszek's teachings with Hsu's analyzing samples of bytes located at the first, middle, and end portions of data blocks to determine a file type so that the best encoder is chosen for each block using more robust information about the data in a block than Franaszek appears to provide. *Id.* at 33–34 (citing Ex. 1002 ¶¶ 140–149). Petitioner contends that Franaszek does not address expressly the situation in which a particular data block may include more than one type of data in the block itself, and that Hsu teaches files could be heterogeneous. *Id.* at 34–35 (citing Ex. 1005, 1097).

Relying on Dr. Creusere's testimony, Petitioner further contends that an artisan of ordinary skill would have been motivated to combine Franaszek and Hsu to handle increasingly ubiquitous heterogeneous files, including data blocks that may have more than one type of data within the data block, and to select encoders for such files by sampling the content of the data block and comparing the samples to known patterns to identify the block type rather than relying solely on the data type included in the file. *Id.* at 35 (citing Ex. 1002 ¶¶ 146–148). Petitioner also argues a PHOSITA would

have considered: (1) continued use of Franaszek's descriptors as a guidepost to indicate to the software what type of data may be included within the file; and (2) use of Hsu's data sampling methods to evaluate the actual content of the file to ensure selection of the best encoding schemes for the particular data block in situations in which Franaszek's data block descriptors still gave an indication of the possible data type within the data block. *Id.* at 34 (citing Ex. 1002 ¶ 144).

In addition, Petitioner argues a PHOSITA would have also recognized that Franaszek's descriptors remained useful as a pointer to a data type in the list of known data patterns in Hsu's collection of known data types. *Id.* at 35–36 (citing Ex. 1002 ¶ 145). Further, Petitioner argues a PHOSITA would have recognized that using a data type to guide Hsu's comparing step for sampling bits could speed up the time needed to identify the data type from Hsu's "known data patterns." *Id.* at 35 (citing Ex. 1002 ¶ 146). Petitioner argues this potential savings in processing time would have been seen as advantageous to a skilled artisan. *Id.* at 35 (citing Ex. 1002 ¶ 147). Then Petitioner argues a PHOSITA would have found this to be a compelling use of a descriptor because a large number of data types would require many comparisons employing Hsu's system, therefore, potentially increasing compression time. *Id.* at 36 (citing Ex. 1002 ¶ 148).

c. Patent Owner's Arguments Pertaining To Claim 104

Patent Owner argues Petitioner proposes that a PHOSITA would be motivated to modify Franaszek by adding Hsu's analysis techniques to identify data blocks' data types. PO Resp. 4 (citing Pet. 31–36). Patent Owner argues Dr. Creusere acknowledges in his testimony that a PHOSITA combining Franaszek with Hsu would always use Hsu to identify a data type

and three redundancy metrics for each of Franaszek's data blocks. PO Resp. 4–5 (citing Ex. 2003, 131:13–132:15) ("If you didn't have the data type, you could then apply Hsu to finding data type and then follow the path to the right in figure 4A, where it says, yes, and move -- and move on.").

Patent Owner argues Dr. Zeger agrees that to the extent a PHOSITA would combine Franaszek with Hsu at all, that PHOSITA would utilize Hsu's powerful data type recognition and redundancy calculation approach as to all data blocks within Franaszek's system. PO Resp. 5 (citing Ex. 2004 ¶ 23). Patent Owner argues Dr. Cruesere's explanation of how a PHOSITA would combine Hsu into Franaszek's Figure 4A is depicted visually below. PO Resp. 5 (citing Ex. 2004 ¶ 24).

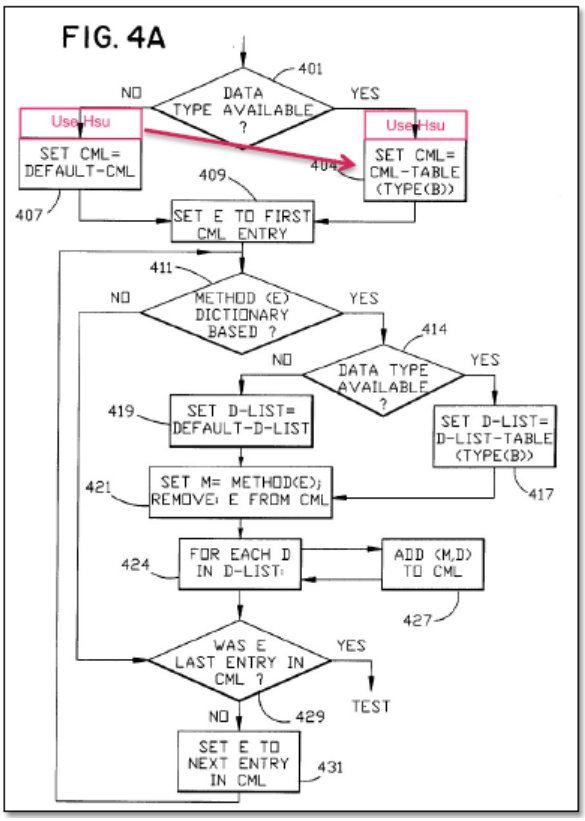


Figure 4A (annotations added by Patent Owner) represents Dr. Cruesere's explanation of how a PHOSITA would combine Hsu into Franaszek's Figure 4A according to Patent Owner.

Patent Owner argues Hsu's approach always identifies a data type. PO Resp. 7. Moreover, Patent Owner argues Dr. Creusere admits that using Hsu's approach will always identify a result for a block's data type. *Id.* In particular, in response to Patent Owner's question of whether Hsu's approach always identifies a given data block, Dr. Creusere answered

> As regards the three redundancy metrics, those are basically statistical analysis calculations, and those can always be calculated for any data block. ***As far as the – as the data type information as output by Hsu's new file routine***, that, that's – that will – that should in my, in my opinion, as a person of ordinary skill in the art, ***my best estimate is that will always output something.*** It will always give you something. Now exactly what it outputs under certain circumstances, I'm not totally sure of.

Id. (quoting Ex. 2003, 21:13–22:6).

Further, Patent Owner argues Dr. Zeger agrees with this portion of Dr. Creusere's testimony. *Id.* (citing Ex. 2004 ¶ 25). Patent Owner points out that Dr. Creusere tried to move off his earlier position of Franaszek "will always outputting something." *Id.* That is, Patent Owner argues that Dr. Creusere attempted to qualify his earlier testimony by stating that Hsu's approach to data type recognition uses "the UNIX file command," that "[t]he UNIX file command . . . will return an indication for any kind of unrecognized file type," and that there is "a possibility" that Hsu would in fact fail to determine a data type and simply return "data." *Id.* (citing Ex. 2003, 146:15–148:1).

In addition, Patent Owner argues Dr. Zeger explains a PHOSITA would understand Hsu to teach an approach that will always recognize a data type for each data block. *Id.* at 8 (citing Ex. 2004 ¶ 27). Patent Owner argues Hsu teaches the identification of a "block type" (i.e., data type) for each data block using a "new-file" procedure. *Id.* (citing Ex. 2004 ¶ 28; Ex. 1005, 1103–1104).

Patent Owner argues Hsu correlates with known patterns to identify the data type of the block as one of ten possible classifications shown in Table I. *Id.* (citing 2004 ¶ 29; Ex. 1005, 1103, 1107). Patent Owner further argues in the scenario that two of the tested segments point to one data type and a third to another, Hsu uses "majority vote" to reconcile the discrepancy. *Id.* (citing Ex. 2004 ¶ 29; Ex. 1005, 1104). Patent Owner also argues in the situation where each of the three segments point to disparate data types, Hsu uses "the first data type detected." *Id.* at 8–9 (citing Ex. 2004 ¶ 29; Ex. 1005, 1104). Hsu's Table I is reproduced below.

Table I. Database of compression algorithms†

	M_{AD}	M_{RL}	M_{SR}
ANSI	arithmetic coding	run-length encoding	Lempel–Ziv
	*	byte-wise encoding	freeze
hexadecimal	arithmetic coding	run-length encoding	Lempel–Ziv
	*	n-bit run count	freeze
natural language	arithmetic coding	*	Lempel–Ziv
	*	*	freeze
source code	arithmetic coding	run-length encoding	Lempel–Ziv
	*	n-bit run count	freeze
low redundancy	*	run-length encoding	Lempel–Ziv
binary	*	n-bit run count	*
audio	*	run-length encoding	Lempel–Ziv
	*	byte-wise encoding	freeze
low resolution	*	run-length encoding	Lempel–Ziv
graphic	*	n-bit run count	freeze
high resolution	JPEG	run-length encoding	JPEG
color graphic	improved Huffman	n-bit run count	improved Huffman
high redundancy	arithmetic coding	run-length encoding	Lempel–Ziv
binary	*	n-bit run count	freeze
object	arithmetic coding	run-length encoding	Lempel–Ziv
	*	byte-wise encoding	freeze

According to Patent Owner, Hsu's Table I includes a list of ten possible data types. *Id.* at 9 (citing Ex. 1005, 1107; Ex. 2004 ¶ 30). Further, Patent Owner argues Hsu specifically explains that its "new file" technique "compares not only the first 512 bytes of a data set, but also 512 bytes in the middle of the set and the 512 bytes at the end (if they exist)" to "provide a better indication of the *primary* data type of a file." *Id.* (citing Ex. 2004 ¶ 30; Ex. 1005, 1104). Moreover, Patent Owner argues Hsu teaches its approach compares those patterns to a larger set of known patterns than previous UNIX versions. *Id.* at 9–10 (citing Ex. 2004 ¶ 30; Ex. 1005, 1104). And Patent Owner argues that the teachings discussed in the previous two sentences lead a PHOSITA to conclude that Hsu teaches an approach that will always recognize and output some data type, and will also be more likely to recognize correctly the data type. *Id.* at 10 (citing Ex. 2004 ¶ 30).

Further, Patent Owner argues Dr. Creusere testifies that a PHOSITA combining Franaszek with Hsu would always use Hsu to identify a block's data type. *Id.* (citing Ex. 2003, 131:13–132:15). And Patent Owner argues Dr. Zeger explains Hsu will always identify a data type for any data block. *Id.* (citing Ex. 2004 ¶¶ 27–31). Patent Owner also argues the combination of Franaszek and Hsu will always identify a data type for each data block. *Id.* at 11–12 (citing Ex. 2004 ¶ 33).

During the Oral Hearing, Patent Owner argued that Petitioner "claim[s] repeatedly in the[] reply brief that our expert, Dr. Zeger, testified that a person of skill in the art would want to make a Franaszek-Hsu combination, that he supports the combination" was taken out of context. Tr. 42:15–43:21.

d. We Find Petitioner Has Sufficiently Shown Unpatentability of Claim 104

We find Petitioner has established by a preponderance of the evidence that claim 104 is unpatentable. That is, we find Petitioner's arguments articulated *supra* in § II.D.2.b. are persuasive.

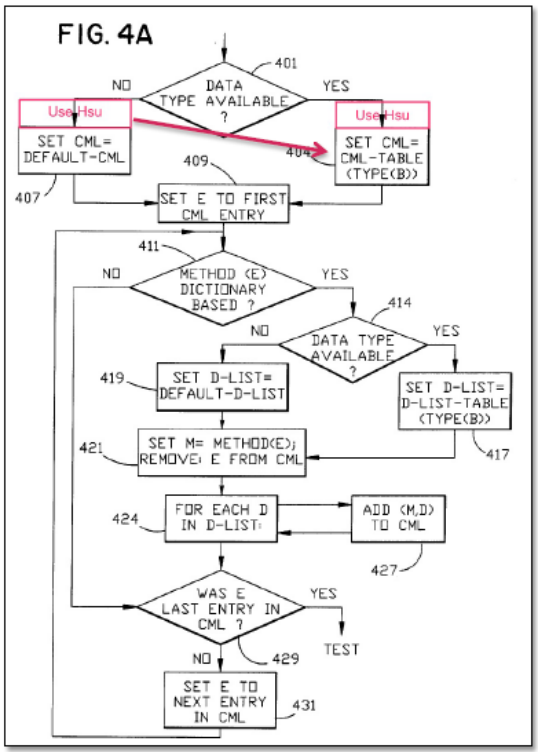
Patent Owner's arguments are based on the notion that the combination of Franaszek and Hsu would *always* teach the if A, then perform step X limitation of claim 104 and would *never* teach the if not A, then perform step Y limitation of claim 104. *See* PO Resp. 1. We need not consider the parties' arguments pertaining to whether the combination of Franaszek and Hsu or the combination of Franaszek, Hsu, and Sebastian teaches the if not A, then perform step Y limitation of claim 104 because Petitioner has established by a preponderance of the evidence that the combination of Franaszek and Hsu would always teach the if A, then perform step X limitation of claim 104.

Significantly, Petitioner, Patent Owner, Dr. Creusere, and Dr. Zeger agree that Franaszek and Hsu would always teach the if A, then perform step X limitation of claim 104. PO Resp. 1, 11–12 (citing Ex. 2004 ¶ 33); Pet. 14–36. We explain their agreement in more detail *infra*.

Patent Owner concedes the combination of Franaszek and Hsu "would always identify a data block's data type." *Id.* Dr. Zeger also gives a reason how a PHOSITA would combine Franaszek and Hsu; that is, Dr. Zeger states to the extent a PHOSITA would combine Franaszek with Hsu at all, that PHOSITA would utilize Hsu's powerful data type recognition and redundancy calculation approach as to all data blocks within Franaszek's system. *Id.* at 5 (citing Ex. 2004 ¶ 23).

Additionally, Dr. Creusere's testimony is that a PHOSITA combining Franaszek with Hsu would always use Hsu to identify a data type and three redundancy metrics for each of Franaszek's data blocks. *Id.* at 4–5 (citing Ex. 2003, 131:13–132:15) ("If you didn't have the data type, you could then apply Hsu to finding data type and then follow the path to the right in figure 4A, where it says, yes, and move -- and move on.").

Patent Owner depicts Dr. Cruesere's explanation of how a PHOSITA would combine Hsu into Franaszek's Figure 4A below. *Id.* at 5 (citing Ex. 2004 ¶ 24).



According to Patent Owner, the above Figure 4A (annotations added by Patent Owner) represents Dr. Cruesere's explanation of how a PHOSITA would combine Hsu into Franaszek's system.

Patent Owner acknowledges Hsu's approach always identifies a data type. PO Resp. 7. And as Patent Owner explains, Dr. Creusere admits that

using Hsu's approach will always identify a result for a block's data type (*id.*); we agree with Dr. Creusere's testimonial admission. In particular, in response to Patent Owner's question of whether Hsu's approach always identifies a given data block, Dr. Creusere answered:

> ***As far as the – as the data type information as output by Hsu's new file routine***, that, that's – that will – that should in my, in my opinion, as a person of ordinary skill in the art, ***my best estimate is that will always output something.*** It will always give you something.

Id. (quoting Ex. 2003, 21:13–22:6).

Further, Dr. Zeger agrees with Dr. Creusere's testimony on this issue. *Id.* (citing Ex. 2004 ¶ 25). And Dr. Zeger admits a PHOSITA would understand Hsu to teach an approach that will always recognize a data type for each data block. *Id.* at 8 (citing Ex. 2004 ¶ 27). Patent Owner acknowledges Hsu describes a system that uses an entirely content-dependent approach. *Id.* (citing Ex. 2004 ¶ 28). Patent Owner also acknowledges Hsu teaches the identification of a "block type" (i.e., data type) for each data block using a "new-file" procedure. *Id.* (citing Ex. 2004 ¶ 28; Ex. 1005, 1103–1104).

In addition, Patent Owner acknowledges Hsu correlates with known patterns to identify the data type of the block as one of ten possible classifications shown in Table I. *Id.* (citing 2004 ¶ 29; Ex. 1005, 1103, 1107). Patent Owner also acknowledges in the scenario that two of the tested segments point to one data type and a third to another, Hsu uses "majority vote" to reconcile the discrepancy. *Id.* (citing Ex. 2004 ¶ 29; Ex. 1005, 1104). Patent Owner further acknowledges in the situation where each of the three segments point to disparate data types, Hsu uses "the first

data type detected." *Id.* at 8–9 (citing Ex. 2004 ¶ 29; Ex. 1005, 1104). Hsu's Table I is reproduced below.

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natural language	arithmetic coding	*	Lempel–Ziv
	*	*	freeze
source code	arithmetic coding	run-length encoding	Lempel–Ziv
	*	n-bit run count	freeze
low redundancy	*	run-length encoding	Lempel–Ziv
binary	*	n-bit run count	*
audio	*	run-length encoding	Lempel–Ziv
	*	byte-wise encoding	freeze
low resolution	*	run-length encoding	Lempel–Ziv
graphic	*	n-bit run count	freeze
high resolution	JPEG	run-length encoding	JPEG
color graphic	improved Huffman	n-bit run count	improved Huffman
high redundancy	arithmetic coding	run-length encoding	Lempel–Ziv
binary	*	n-bit run count	freeze
object	arithmetic coding	run-length encoding	Lempel–Ziv
	*	byte-wise encoding	freeze

According to Patent Owner, Hsu's Table I shown above includes a list of ten possible data types. *Id.* at 9 (citing Ex. 1005, 1107; Ex. 2004 ¶ 30).

In addition, Patent Owner acknowledges Hsu specifically explains that its "new file" technique "compares not only the first 512 bytes of a data set, but also 512 bytes in the middle of the set and the 512 bytes at the end (if they exist)" to "provide a better indication of the *primary* data type of a file." *Id.* (citing Ex. 2004 ¶ 30; Ex. 1005, 1104). Moreover, Patent Owner acknowledges Hsu teaches its approach compares those patterns to a larger set of known patterns than previous UNIX versions. *Id.* at 9–10 (citing Ex. 2004 ¶ 30; Ex. 1005, 1104). And Patent Owner acknowledges the teachings discussed in the previous two sentences lead a PHOSITA to conclude that Hsu teaches an approach that will always recognize and output some data type and will also be more likely to recognize correctly the data type. *Id.* at 10 (citing Ex. 2004 ¶ 30).

Furthermore, we find Dr. Creusere's testimony persuasively explains that a PHOSITA combining Franaszek with Hsu would always use Hsu to identify a block's data type. *Id.* (citing Ex. 2003, 131:13–132:15). And Dr. Zeger acknowledges Hsu will always identify a data type for any data block. *Id.* (citing Ex. 2004 ¶¶ 27–31). Patent Owner also concedes the combination of Franaszek and Hsu will always identify a data type for each data block. *Id.* at 11–12 (citing Ex. 2004 ¶ 33).

We disagree with Patent Owner's arguments made during Oral Hearing (Tr. 42:15–43:21) that Dr. Zeger's testimony was taken out of context for the following reasons. It is noted that Dr. Zeger explicitly states in the Declaration:

> the ensuing combination of Franazek and Hsu will always recognize a data type of a data block, will always have one or more encoders associated with each data block, and will ultimately always compress that data block using those one or more associated encoders. In other words, the combined system of Franaszek and Hsu would never use or perform Franaszek's step 407.

Ex. 2004 ¶ 38. This statement is further supported by both Exhibit 1035[14] and Exhibit 2004. *See e.g.*, Ex. 1035, 36:8–12, 38:16–39:21; Ex 2004 ¶¶ 22, 24, 27, 28.[15] Dr. Zeger's opinion is that if Franaszek and Hsu are combined, then this combination would always recognize data type, and, therefore,

[14] Patent Owner refers to Exhibit 1031. Tr. 43:1. Since there is no Exhibit 1031 and the page and line numbers are accurate for Exhibit 1035, we are interpreting Patent Owner's reference to Exhibit 1031 in the Transcript as Exhibit 1035.

[15] We considered and dismiss Patent Owner's objection (Tr. 64:1–7) as moot because this objection pertains to IPR2017-00179, rather than the present case. *See* Tr. 58:6–59:5.

always perform the if A, then perform step X limitation of claim 104. In addition, Dr. Zeger's opinion that the Franaszek and Hsu combination fails applies only to the if not A, then perform step Y limitation of claim 104. Dr. Zeger's opinion that the combination fails was given in the context of his opinion that both the if A, then perform step X limitation of claim 104 and the if not A, then perform step Y limitation of claim 104, must be taught in order to demonstrate unpatentability. It is noted that claim 104 is a method claim being analyzed under *Schulhauser*[16]; therefore, it is sufficient for Petitioner to show that the combination of Franaszek and Hsu teaches either the if A, then perform step X limitation of claim 104 or the if not A, then perform step Y limitation of claim 104.

We find Dr. Zeger's testimony regarding the absence of a rationale to combine to be unpersuasive because it was based on the assumption that both alternate steps of claim 104 must be met. We, therefore, also find that Dr. Zeger's testimony does not counter persuasively Petitioner's showing that a PHOSITA would have had reason to combine Franaszek and Hsu in a manner that would have taught the if A, then perform step X limitation of claim 104.

Accordingly, we are persuaded Petitioner has established by a preponderance of the evidence that: (1) Franaszek and Hsu teaches the if A, then perform step X limitation of claim 104; and (2) a PHOSITA would have combined Franaszek and Hsu.[17] Petitioner has made sufficient

[16] *Supra* § II.C.
[17] We considered Patent Owner's objections (Tr. 30:1–34:4, 63:17–23) and dismiss them as moot because we did not rely on Petitioner's theory that Franaszek does not have a data type, then if you were to use Hsu in that

showings that both grounds would have taught the remaining limitations of claim 104 (Pet. 14–36) and Patent Owner does not dispute these assertions (Paper 20, § B.1.b.) ("[A]ny arguments for patentability not raised in the response will be deemed waived.").

e. Conclusion

In conclusion, and having performed the factual inquiries required by *Graham*, for the reasons given above and based on our review of the arguments and evidence of record, Petitioner has shown by a preponderance of the evidence that the combination of: (1) Franaszek and Hsu; and (2) Franaszek, Hsu, and Sebastian render obvious the subject matter of claim 104 of the '506 patent.[18]

3. Claim 105

a. Analysis Overview

The applicable law is discussed *supra* in § II.A. And as explained *supra* in § II.C., we need not consider whether both conditional limitations of claim 105 are met; that is, Petitioner only needs to show sufficiently that one of the following limitations is met: (1) the if A, then perform step X limitation of claim 105; and (2) the if not A, then perform step Y limitation of claim 105.

We, therefore, focus on the parties' arguments pertaining to whether: (1) the combination of Franaszek and Hsu teaches the if A, then perform step X limitation of claim 105; and (2) a PHOSITA would have combined Franaszek and Hsu to arrive at the claimed invention. In the event that we

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circumstance, you would always end up with the wrong data type.

[18] We note that Patent Owner did not proffer a substantive argument regarding objective indicia of non-obviousness. *See generally* PO Resp.

determine elements (1) and (2) of the immediate preceding sentence are fulfilled sufficiently, then we need not determine if the cited prior art teaches the if not A, then perform step Y limitation of claim 105 for the reasons discussed *supra* in § II.C. We, therefore, also find that if both elements from the first sentence of this paragraph are fulfilled sufficiently, our conclusion will apply to both of Petitioner's grounds (i.e., (1) Franaszek and Hsu; and (2) Franaszek, Hsu, and Sebastian).[19] Because Petitioner has the burden of proof (*see* 35 U.S.C. § 316(e), 37 C.F.R. § 42.20(c)), we begin with Petitioner's arguments.

b. Petitioner Argues the Prior Art Teaches the Limitations Recited in Claims 105

Petitioner asserts that the subject matter of claim 105 would have been obvious in view of Franaszek and Hsu under 35 U.S.C. § 103(a). Pet. 36–44. In particular, Petitioner explains where each limitation of claim 105 is taught in Franaszek and Hsu. *Id.*

Petitioner argues Franaszek teaches if a data type (e.g., text, image, etc.) for an uncompressed block is available, the CML is set to a list of compression methods that have been preselected for that data type, which

[19] In both grounds, Petitioner asserts that Franaszek and Hsu (without Sebastian) teach or suggest the if A, then perform step X limitation of claim 105. *See e.g.*, PO Resp. 14 ("Accordingly, in the combined system of Franaszek and Hsu, [the if A, then perform step X limitation of claim 105] will always occur" and "[s]ince [the if A, then perform step X limitation of claim 105] will *always* occur in the combined system of Franaszek and Hsu, [the if not A, then perform step Y limitation] will *never* occur."); Pet. 43–44. We, therefore, are not persuaded by Patent Owner's arguments pertaining to the Board instituting on only Franaszek, Hsu, and Sebastian. PO Br. 5 (citing PO Resp. 15–19).

Petitioner maps to the limitation "wherein if one or more encoders are associated to said type, compressing said data block with at least one of said one or more encoders" recited in claim 105. *Id.* at 39–40 (citing Ex. 1004, 5:49–53; Ex. 1002 ¶¶ 163–165).

Furthermore, Petitioner cross-references the claim 104 arguments for mapping Hsu to the limitation "wherein the analyzing of the data within the data block to identify one or more data types excludes analyzing based only on a descriptor that is indicative of the data type of the data within the data block" as recited in claim 105. *Id.* at 43–44. And Petitioner cross-references the claim 104 arguments for combining Franaszek and Hsu. *Id.* at 43–44; *see supra* § II.D.2.b.

c. Patent Owner's Arguments Pertaining To Claim 105

Patent Owner argues the combination of Franaszek and Hsu ultimately defeats Petitioner's obviousness theory because, as with claim 104, the ensuing system would always perform the if A, then perform step X limitation of claim 105 and would never perform the if not A, then perform step Y limitation of claim 105. PO Resp. 12 (citing Ex. 2004 ¶¶ 35–38).

Patent Owner explains that Petitioner discusses its obviousness theory with respect to the if A, then perform step X limitation of claim 105, by asserting that when Franaszek has a data type, it will use a CML of compression methods that has been "preselected for that data type." *Id.* at 13 (citing Pet. 39). Patent Owner further explains Petitioner asserts that Franaszek meets the if A, then perform step X limitation of claim 105 by stating "in the event that a data type is present, 'one or more encoders' are associated with that data type and are used to select 'at least one of said one or more encoders,' which are then used to compress the entire data block."

Id. (citing Pet. 40). Patent Owner argues Petitioner recognizes Franaszek's teaching that as long as it has a data type, there will always be "one or more encoders [] associated to said type" and the data block will always be compressed "with at least one of said one or more encoders." *Id.* (citing Ex. 2004 ¶ 37).

Similarly, Patent Owner argues Hsu's data analysis approach discussed *supra*, will always recognize a data type. *Id.* (citing Ex. 2004 ¶¶ 27–31). According to Patent Owner, because Petitioner proposes modifying the system of Franaszek to incorporate Hsu's data type analysis approach, and since Dr. Creusere admits that Hsu's approach would always be used, it is therefore necessarily true that the ensuing combination system will always recognize a data type of a data block, will always have one or more encoders associated with each data block, and will ultimately always compress that data block using those one or more associated encoders. *Id.* at 13–14 (citing Ex. 2004 ¶ 38; Ex. 2003, 131:13–132:15).

Stated another way, Patent Owner argues when combining Franaszek and Hsu, the if A, then perform step X limitation of claim 105 will always occur. *Id.* at 14. Patent Owner argues this is fatal for Petitioner's theory because the if not A, then perform step Y limitation of claim 105 will never occur. *Id.* In summary, Patent Owner's argument is: because the if A, then perform step X limitation of claim 105 will *always* occur in the combined system of Franaszek and Hsu, the if not A, then perform step Y limitation of claim 105 will *never* occur. *Id.*

Patent Owner argues Dr. Creusere admits that Hsu's approach would always be used to identify a data type for Franaszek's data blocks. *Id.* (citing Ex. 2003, 131:13–132:15). Patent Owner argues Dr. Creusere further

testifies that once Franaszek's system has been modified with Hsu, Hsu's teachings are part of the overall system. *Id.* at 14–15 (citing Ex. 2003, 135:4–7). Patent Owner argues that ensuing system would always identify a data type. *Id.* at 15 (citing Ex. 2004 ¶¶ 27–31).

During the Oral Hearing, Patent Owner argued that Petitioner "claim[s] repeatedly in the[] reply brief that our expert, Dr. Zeger, testified that a person of skill in the art would want to make a Franaszek-Hsu combination, that he supports the combination" was taken out of context. Tr. 42:15–43:21.

d. We Find Petitioner Has Sufficiently Shown Unpatentability of Claim 105

We find Petitioner has established by a preponderance of the evidence that claim 105 is unpatentable. That is, we find Petitioner's arguments articulated *supra* in § II.D.3.b. are persuasive.

Patent Owner's arguments are based on the notion that the combination of Franaszek and Hsu would always teach the if A, then perform step X limitation of claim 105 and would never teach the if not A, then perform step Y limitation of claim 105. *See* PO Resp. 1–2. We need not consider the parties' arguments pertaining to whether the combination of Franaszek and Hsu or the combination of Franaszek, Hsu, and Sebastian teaches the if not A, then perform step Y limitation of claim 105 because Petitioner has established by a preponderance of the evidence that the combination of Franaszek and Hsu would always teach the if A, then perform step X limitation of claim 105.

Significantly, Petitioner, Patent Owner, Dr. Creusere, and Dr. Zeger agree that Franaszek and Hsu would always teach the if A, then perform step

X limitation of claim 105. PO Resp. 1–2, 12–14 (citing Ex. 2004 ¶¶ 35–38); Pet. 36–44. We explain their agreement in more detail *infra*.

Patent Owner argues the combination of Franaszek and Hsu ultimately defeats Petitioner's obviousness theory and acknowledges, as with claim 104, the ensuing system would always perform the if A, then perform step X limitation of claim 105. PO Resp. 12 (citing Ex. 2004 ¶¶ 35–38).

Patent Owner explains that Petitioner discusses its obviousness theory with respect to the if A, then perform step X limitation of claim 105, by asserting that when Franaszek has a data type, it will use a CML of compression methods that has been "preselected for that data type." *Id.* at 13 (citing Pet. 39). Patent Owner further explains Petitioner asserts that Franaszek meets the if A, then perform step X limitation of claim 105 by stating "in the event that a data type is present, 'one or more encoders' are associated with that data type and are used to select 'at least one of said one or more encoders,' which are then used to compress the entire data block." *Id.* (citing Pet. 40). Patent Owner and Petitioner characterize Franaszek's teaching as if Franaszek has a data type, there will always be "one or more encoders [] associated to said type" and the data block will always be compressed "with at least one of said one or more encoders." *Id.* (citing Ex. 2004 ¶ 37).

Similarly, Patent Owner acknowledges Hsu's data analysis approach discussed *supra*, will always recognize a data type. *Id.* (citing Ex. 2004 ¶¶ 27–31). Patent Owner concedes because Petitioner proposes modifying the system of Franaszek to incorporate Hsu's data type analysis approach, and since Dr. Creusere admits that Hsu's approach would always be used, it

is therefore necessarily true that the ensuing combination system: will always recognize a data type of a data block; will always have one or more encoders associated with each data block; and will ultimately always compress that data block using those one or more associated encoders. *Id.* at 13–14 (citing Ex. 2004 ¶ 38; Ex. 2003, 131:13–132:15). Stated differently, Patent Owner concedes when combining Franaszek and Hsu, the if A, then perform step X limitation of claim 105 will always occur. *Id.* at 14.

We disagree with Patent Owner's arguments made during Oral Hearing that Dr. Zeger's testimony was taken out of context (Tr. 42:15–43:21) for at least the same reasons articulated *supra* in § II.D.2.d., 35–36.

Accordingly, we are persuaded Petitioner has established by a preponderance of the evidence that: (1) Franaszek and Hsu teaches the if A, then perform step X limitation of claim 105; and (2) a PHOSITA would have combined Franaszek and Hsu.

e. Conclusion

In conclusion, and having performed the factual inquiries required by *Graham*, for the reasons given above and based on our review of the arguments and evidence of record, Petitioner has shown by a preponderance of the evidence that the combination of: (1) Franaszek and Hsu; and (2) Franaszek, Hsu, and Sebastian render obvious the subject matter of claim 105 of the '506 patent.[20, 21] Petitioner has made sufficient showings that

[20] We note that Patent Owner did not proffer a substantive argument regarding objective indicia of non-obviousness. *See generally* PO Resp.
[21] We considered Patent Owner's objections (Tr. 30:1–34:4, 63:17–23) and dismiss them as moot because we did not rely on Petitioner's theory that Franaszek does not have a data type, then if you were to use Hsu in that circumstance, you would always end up with the wrong data type.

both grounds would have taught the remaining limitations of claim 105 (Pet. 36–44) and Patent Owner does not dispute these assertions (Paper 20, § B.1.b.) ("[A]ny arguments for patentability not raised in the response will be deemed waived.").

4. Conclusion

In conclusion, for the reasons given above and based on our review of the parties' arguments and evidence, Petitioner has shown by a preponderance of the evidence that the combination of: (1) Franaszek and Hsu; and (2) Franaszek, Hsu, and Sebastian render obvious the subject matter of claim 105 of the '506 patent.

III. CONCLUSION

In conclusion, Petitioner has shown by a preponderance of the evidence that claims 104 and 105 are unpatentable under 35 U.S.C. § 103(a) in view of the combination of: (1) Franaszek and Hsu; and (2) Franaszek, Hsu, and Sebastian for the reasons explained *supra* § II.

IV. ORDER

Accordingly, it is

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 104 and 105 of the '506 patent are unpatentable;

FURTHER ORDERED that a copy of this Decision will be entered into the record of IPR2017-00176, IPR2017-00806, and IPR2017-01688; and

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

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