

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICROSOFT CORPORATION, MICROSOFT MOBILE INC.,
HTC CORPORATION, and HTC AMERICA, INC.,
Petitioner,

v.

KONINKLIJKE PHILIPS N.V.,
Patent Owner.

Case IPR2017-00890
Patent 6,522,695 B1

Before TREVOR M. JEFFERSON, CHARLES J. BOUDREAU, and
KAMRAN JIVANI, *Administrative Patent Judges*.

JIVANI, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
Determining Claims 14, 15, and 17 Unpatentable
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Microsoft Corporation, Microsoft Mobile Inc., HTC Corporation, and HTC America, Inc. (collectively, “Petitioner”) sought an *inter partes* review of claims 14, 15, and 17 (the “challenged claims”) of U.S. Patent No. 6,522,695 B1 (“the ’695 patent”). Paper 1 (“Petition” or “Pet.”). Patent Owner Koninklijke Philips N.V. filed a Preliminary Response. Paper 6. Upon consideration of the Petition and Preliminary Response, we instituted an *inter partes* review pursuant to 35 U.S.C. § 314 of the challenged claims. Paper 7 (“Decision on Institution” or “Dec. on Inst.”), 29.

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that the challenged claims are unpatentable.

II. BACKGROUND

A. *Procedural History and Asserted Grounds of Unpatentability*

Petitioner advanced the following grounds of unpatentability under 35 U.S.C. § 103(a) in the Petition (Pet. 4):

1. Claims 14, 15, and 17 over Green¹ and Blue²;
2. Claims 14 and 15 over Clark³;

¹ Consultative Committee for Space Data Systems Report Concerning Space Data System Standards: Lossless Data Compression, Green Book (“Green”) (Ex. 1003).

² Consultative Committee for Space Data Systems Report Concerning Space Data System Standards: Lossless Data Compression, Blue Book (“Blue”) (Ex. 1009).

³ Clark, U.S. Patent No. 5,177,480 (“Clark”) (Ex. 1004).

3. Claim 17 over Clark and Bliss⁴;
4. Claims 14 and 15 over Venbrux⁵; and
5. Claims 17 over Venbrux and Bliss.

In our Decision on Institution, we instituted review of claims 14 and 15 over Green and Blue, claims 14 and 15 over Venbrux, and claim 17 over Venbrux and Bliss. Dec. on Inst. 29. We, thus, instituted review of all challenged claims, albeit on fewer than all asserted grounds. *Id.* On April 24, 2018, the Supreme Court held that a decision to institute under 35 U.S.C. § 314 may not institute review on less than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 2018 WL 1914661, at *10 (U.S. Apr. 24, 2018). Thereafter, we modified our Decision on Institution to institute all grounds of unpatentability asserted against claims 14, 15, and 17, as presented in the Petition. Paper 40, 2.

After institution, Patent Owner filed a Patent Owner Response (Paper 25, “PO Resp.”) and observations on cross examination (Paper 34). Patent Owner also filed, with our prior authorization, a motion for additional discovery. Paper 15. Petitioner opposed (Paper 19) and we denied Patent Owner’s motion. Paper 47.

Petitioner filed a Reply to the Patent Owner Response (Paper 30, “Reply”) and a response to Patent Owner’s observations on cross examination (Paper 44). Petitioner also filed, with our prior authorization, a motion to submit supplemental information. Paper 14. Patent Owner

⁴ Venbrux et al., A VLSI Chip Set for High-Speed Lossless Data Compression, IEEE Transactions on Circuits and Systems for Video Technology, Vol. 2, No. 4 (Dec. 1992) (“Venbrux”) (Ex. 1005).

⁵ Bliss, et al., U.S. Patent No. 6,009,549 (“Bliss”) (Ex. 1006).

opposed this motion. Paper 17. We resolve below Petitioner's motion to submit supplemental information. *See infra* Section IV.

In addition to the foregoing papers, the parties also filed cross motions to exclude certain evidence. Paper 38 (Pet. Motion); Paper 35 (PO Motion). Each party opposed the other party's motion. Paper 43 (Pet. Opposition); Paper 42 (PO Opposition). Each party replied in support of its own motion to exclude. Paper 46 (Pet. Reply); Paper 45 (PO Reply). We resolve below the parties' motions to exclude. *See infra* Sections V, VI.

Both parties requested an oral hearing, and a hearing was held on May 22, 2018. Paper 41. A transcript of the oral hearing has been entered into the record. Paper 48 ("Tr.").

B. Testimony

Petitioner supports its challenges with declarations of Dr. Kenneth R. Castleman. Exs. 1002, 1031. Dr. Castleman testified by depositions on November 21, 2017, and on April 12, 2018, and transcripts of his testimony have been entered into evidence. Exs. 2018, 2028.

Patent Owner supports its challenges with a declaration of Dr. Charles Boncelet, Jr. Ex. 2016. Dr. Boncelet testified by deposition on February 16, 2018, and a transcript of his testimony has been entered into evidence. Ex. 1032.

C. Related Proceedings

Petitioner identifies several actions for infringement of the '695 patent pending in the United States District Court for the District of Delaware. Pet. 1–2.

D. Overview of the '695 patent (Ex. 1001)

The '695 patent relates to compressing a digital information signal and efficiently transmitting it. Ex. 1001, 1:10–12. The '695 patent seeks to transmit the digital information signal using as few bits as possible. *Id.* at 1:39–41 (“It is an object of the invention to provide a transmitter and/or receiver which transmits a digital information signal with a smaller or at the most equal number of bits.”). The '695 patent discloses a transmitter that encodes the digital information signal for compression and provides the signal to a receiver that decodes the signal. *Id.* at 1:10–12, 1:40–44.

The invention of the '695 patent “is based on recognition of the fact that by using an encoder, the number of bits required to transmit a digital information signal is not always reduced.” *Id.* at 2:60–63. In some instances, encoding results in a signal using more bits than the original digital information signal itself. *Id.* at 2:63–65. Because the '695 patent aims to use as few bits as possible, the '695 patent describes transmitting either the encoded or original digital information signal, depending on whichever requires the smaller number of bits. *Id.* at 2:66–3:1. An identification signal is included in the transmission, indicating whether the transmission has been encoded by a given encoding method. *Id.* at 3:2–4. Figure 2 of the '695 patent is reproduced below.

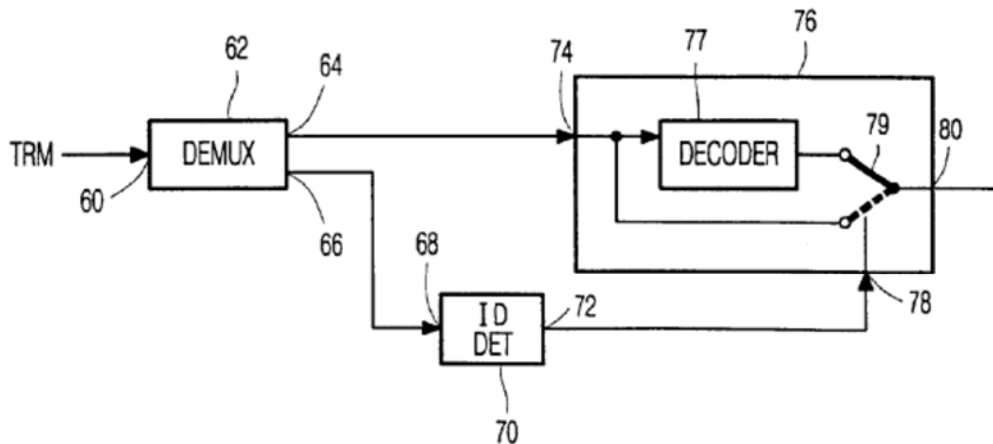


FIG. 2

Figure 2 depicts “a receiver in accordance with the invention, for receiving a composite signal TRM.” *Id.* at 5:64–65. “A version of the digital information signal is derived from the composite signal TRM. An exact or a non-exact copy of the digital information signal will be derived depending on the coding used in the transmitter.” *Id.* at 5:65–6:2.

The composite signal TRM is input into demultiplexer 62. *Id.* at 6:2–3. Demultiplexer 62 derives from the composite signal TRM a version of the digital information signal, and this version may include one or more signal portions. *Id.* at 6:5–10. A signal portion can be, for instance, a track of a disk. *Id.* This version of the digital information signal is applied to output 64. *Id.* Demultiplexer 62 also derives from the composite signal TRM an identification signal. *Id.* at 6:2–4. The identification signal “specifies how the version of the digital information signal has been encoded.” *Id.* at 6:11–6:13. The identification signal further specifies whether each signal portion on output 64 has been encoded. *Id.* at 6:13–15. The identification signal is applied to output 66. *Id.* at 6:11–13.

Identifier 70 receives the identification signal at input 68 and derives a control signal therefrom. *Id.* at 6:16–19. If the corresponding signal portion of the digital information signal is encoded, the control signal derived by identifier 70 will be of a first type. *Id.* at 6:19–22. If, however, the corresponding signal portion is not encoded, the control signal derived by identifier 70 will be of a second type. *Id.* at 6:22–26. The control signal is applied to output 72. *Id.* at 6:17–19.

Decoding unit 76 receives the control signal at input 78 and the corresponding signal portion of the digital information signal at input 74. *Id.* at 6:27–29. The signal portion is passed to decoder 77, which applies the decoded signal portion to switch 79. *Id.* at 6:29–32. The signal portion is also passed directly to switch 79, bypassing decoder 77. *Id.* at 6:32–37, Fig. 2. If the control signal is of a first type (indicating that the signal portion is encoded), switch 79 couples the decoded signal portion to output 80. *Id.* If, however, the control signal is of a second type (indicating that the signal portion is not encoded), the corresponding signal portion is not encoded, and switch 79 couples the signal portion in substantially unmodified form to output 80. *Id.* at 6:32–37, 6:46–48.

In one embodiment, the receiver of Figure 2 is included within a reproducing receiver. *Id.* at 7:24–28, Figure 4 is reproduced below.

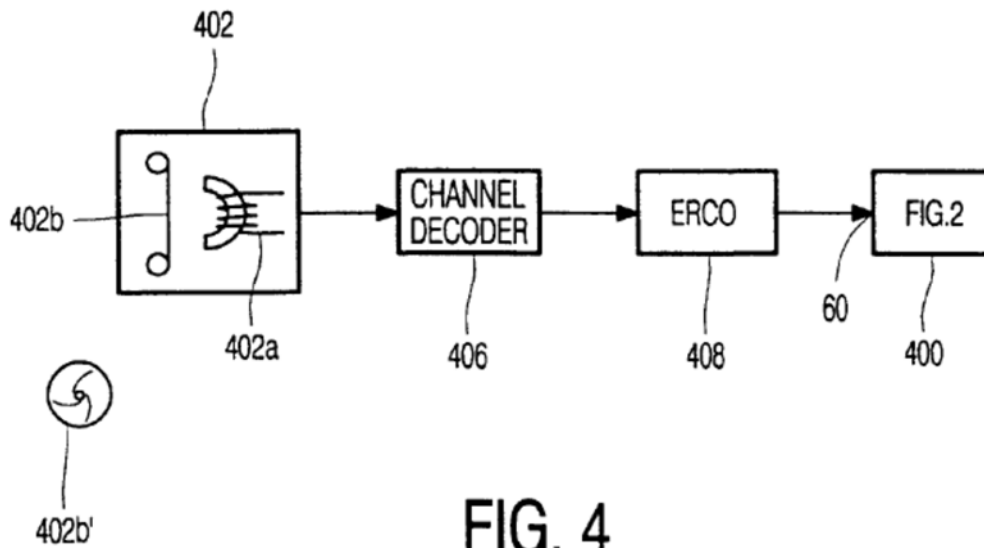


FIG. 4

Figure 4 depicts a reproducing receiver including circuit block 400, which “is equivalent to the block diagram” of Figure 2. *Id.* at 7:24–28. “The reproducing receiver further includes a reader 402, a channel decoder 406 and an error detector 408 for detecting or, if possible, an error corrector 408 for correcting errors in the signal.” *Id.* at 7:28–32. Reader 402 provides a signal from record carrier 402b/b’ to channel decoder 406 and error detector/corrector 408. *Id.* at 7:33–35. The output of detector/corrector 408 is supplied to the receiver of Figure 2 on input 60, i.e., the composite signal TRM. *Id.* at 7:24–28.

E. Challenged Claims

Claim 14 is independent, and claims 15 and 17 depend therefrom.

Claims 14, 15, and 17 are reproduced below, with bracketed material added.

14. A receiver comprising:

[14a.] receiving means for receiving a composite signal from a transmission medium;

[14b.] demultiplexing means for deriving at least one signal portion from the composite signal and for deriving a first identification signal of a first type and a second type from the composite signal;

[14c.] decoding means for decoding at least one signal portion and for decoding a signal portion into a portion of the [sic] digital information signal and to supply the portion of a digital information signal depending on a control signal of a first type and to supply a signal portion as a portion of the digital information signal in a substantially unmodified form depending on a control signal of a second type; and

[14d.] means for generating the control signal for application to the decoding means including a control signal of the first type depending on the first identification signal of the first type.

15. The receiver of claim 14, in which:

[15a.] the demultiplexing derive [sic] a first identification signal of a second type from the composite signal; and

[15b.] the means for generating the control signal generate a control signal of the second type depending on the first identification signal of the second type;

17. A receiving device as claimed in claim 14, in which the receiver further comprises:

[17a.] a device for reading out a signal recorded on a record carrier; and

at least one of

[17b.] channel decoding means for the channel decoding of the read-out signal and

[17c.] error detection/correction means detecting and correcting errors in the read-out signal.

III. ANALYSIS

A. *Principles of Law*

Petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375,

1378 (Fed. Cir. 2015). To prevail in its challenges to the challenged claims, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

A claim is unpatentable under 35 U.S.C. § 103(a) 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 of the invention to a person having ordinary skill in the art. *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, if presented, (4) objective evidence of nonobviousness, i.e., secondary considerations such as commercial success, long felt but unsolved needs, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). The obviousness inquiry further requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)).

B. Level of Ordinary Skill in the Art

Petitioner states that a person having ordinary skill in the art “for the technology in the ’695 patent would have had at least a bachelor’s degree in electrical engineering and three to five years of experience in audio and/or video compression and decompression.” Pet. 9 (citing Ex. 1002 ¶¶ 44–46). Patent Owner does not dispute Petitioner’s definition, presents an analysis based on Petitioner’s definition, and argues that, even under Petitioner’s

definition, Petitioner has failed to show the challenged claims are unpatentable. PO Resp. 8 (Ex. 2016 ¶¶ 30–40).

In view of the foregoing, we adopt Petitioner’s formulation of the level of ordinary skill in the art. Further, this level of ordinary skill is reflected by the prior art of record. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art itself can reflect the appropriate level of ordinary skill in the art).

C. *Claim Construction*

1. *Applicable Standards and General Principles*

We interpret claims of an unexpired patent using the broadest reasonable construction in light of the specification of the patent in which they appear. See 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). Although the ’695 patent’s expiration date is not mentioned by either party, we note that the ’695 patent issued from an application filed March 16, 1999, does not claim the benefit of any earlier-filed application, and accordingly expires no later than March 16, 2019. 35 U.S.C. § 154(a)(2). Because the ’695 patent has not expired, we apply the broadest reasonable construction standard. See *id.*

Under the broadest reasonable construction standard, claim terms generally are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. See *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). The claims, however, “should always be read in light of the specification and teachings in the underlying patent,” and “[e]ven under the broadest reasonable interpretation, the Board’s construction cannot be

divorced from the specification and the record evidence.” *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015) (citations omitted). Further, any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *See In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In the absence of such a definition, limitations are not to be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

A claim limitation using the phrase “means for” creates a rebuttable presumption that the drafter intended to invoke 35 U.S.C. § 112 ¶ 6.⁶ *See Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015). Section 112 ¶ 6 provides that:

An element in a claim for a combination may be expressed as a means . . . for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

Construing a means-plus-function claim term is a two-step process, wherein we first identify the claimed function and then determine what structure, if any, disclosed in the specification corresponds to the claimed function. *Id.* at 1351; *Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1210 (Fed. Cir. 2003); *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 1119 (Fed. Cir. 2002). Moreover, “structure disclosed in the specification is ‘corresponding’ structure only if

⁶ Section 4(c) of the Leahy-Smith America Invents Act (AIA), Pub. L. No. 112-29, § 4(c), 125 Stat. 284 (2011), re-designated 35 U.S.C. § 112 ¶ 6 as 35 U.S.C. § 112(f). Because the ’695 patent has a filing date before September 16, 2012 (effective date of the statute), we refer to the pre-AIA version of 35 U.S.C. § 112.

the specification or prosecution history clearly links or associates that structure to the function recited in the claim.” *Golight, Inc. v. Wal-Mart Stores, Inc.*, 355 F.3d 1327, 1334 (Fed. Cir. 2004); *Cardiac Pacemakers*, 296 F.3d at 1113. This analysis applies under the broadest reasonable construction standard. *In re Aoyama*, 656 F.3d 1293, 1297 (Fed. Cir. 2011) (“[T]he broadest reasonable interpretation . . . [of] means-plus-function language is that statutorily mandated in [Section 112] paragraph six.” (quoting *In re Donaldson Co.*, 16 F.3d 1189, 1194–95 (Fed. Cir. 1994) (en banc))); *Donaldson*, 16 F.3d at 1193 (“[P]aragraph six applies regardless of the context in which the interpretation of means-plus-function language arises, i.e., whether as part of a patentability determination in the PTO or as part of a validity or infringement determination in a court.”).

Our Rules specifically require that a petition for *inter partes* review identify how each challenged claim is to be construed, including identification of the corresponding structure for means-plus-function limitations. 37 C.F.R. § 42.104(b)(3). In particular, where the claim to be construed contains a means-plus-function limitation as permitted under 35 U.S.C. § 112 ¶ 6, the construction of the claim must identify the specific portions of the specification that describe the structure, material, or acts corresponding to each claimed function. *Id.*

Petitioner asserts the following claim limitations constitute means-plus-function limitations as permitted under 35 U.S.C. 112 ¶ 6: 14a–14d, 15a and 15b, and 17a–17c. Pet. 9–14; *see also supra* Section II.E (bracketed notations identifying limitations). For each limitation, Petitioner identifies a recited function and corresponding structure disclosed in the Specification. Pet. 9–14. Patent Owner contends that limitation 14b is not properly

construed as a means-plus-function limitation. PO Resp. 14. Patent Owner does not challenge Petitioner's identification of other limitations as subject to construction under 35 U.S.C. § 112 ¶ 6 or Petitioner's corresponding proffered constructions of those limitations. *Id.* Because Petitioner's constructions of limitations 14a, 14c, 14d, 15a, 15b, and 17a–17c are not controverted in the record before us, we do not construe these terms. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (explaining that only claim terms in controversy need to be construed, and only to the extent necessary to resolve the controversy).

2. *Limitation 14b: demultiplexing means for deriving at least one signal portion from the composite signal and for deriving a first identification signal of a first type and a second type from the composite signal*

Petitioner asserts this limitation is governed by 35 U.S.C. § 112 ¶ 6. Pet. 10. Relying on Dr. Castleman's testimony, Petitioner states the recited functions are “deriving at least one signal portion from the composite signal” and “deriving a first identification signal of a first type and a second type from the composite signal.” *Id.* (citing Ex. 1002 ¶ 53). Petitioner identifies “demultiplexer unit 62 and its equivalents” as the structure corresponding to the recited demultiplexing means. *Id.* (citing Ex. 1002 ¶ 54). Conversely, Patent Owner contends “that this term should not be construed under 35 U.S.C. § 112, 6th paragraph.” PO Resp. 14.

A claim limitation using the phrase “means for” creates a rebuttable presumption that the drafter intended to invoke 35 U.S.C. § 112 ¶ 6. *See Williamson*, 792 F.3d at 1348. We agree with Petitioner that construction of limitation 14b is governed by 35 U.S.C. § 112 ¶ 6, and we adopt Petitioner's construction thereof. Patent Owner fails to rebut persuasively the

assumption that the recited demultiplexing means is intended to invoke 35 U.S.C. § 112 ¶ 6. PO. Resp. 14. For instance, Patent Owner offers no evidence from the Specification or prosecution history in support of its assertion. *Id.* Accordingly, Patent Owner has not sufficiently rebutted in the record before us the presumption that limitation 14b was intended to invoke 35 U.S.C. § 112 ¶ 6.

We note, in any event, that Patent Owner’s alternative construction of limitation 14b as “a demultiplexer (e.g., demultiplexer 62) that carries out the claimed function, and equivalents thereto” accords with Petitioner’s identification of structure corresponding to the recited demultiplexing means. *Compare* Pet. 10, with PO Resp. 14.

3. *Limitation 14c: “a portion of the digital information signal in a substantially unmodified form”*

In our Decision on Institution, we directed the parties to address specifically the meaning of this element. In so doing, we instructed that the parties should cite all evidence in support of their positions, including but not limited to any relevant portions of the Specification, the prosecution history, and testimony.

The parties agree that limitation 14c requires decoding and supplying the portion of the digital information signal depending on a control signal of a first type, and for supplying a signal portion in a substantially unmodified form depending on a control signal of a second type. Patent Owner states, “[p]ut even more simply, the first type control signal corresponds to decoded form, and the second type control signal corresponds to substantially unmodified form.” PO Resp. 11 (emphasis omitted). Patent Owner explains, “‘substantially unmodified’ refers to a comparison between (1) the input (‘a signal portion’) of the ‘decoding means for decoding at least one

signal portion,’ and (2) the output (what is ‘supplied’) of the ‘decoding means for decoding at least one signal portion.” *Id.* at 12 (emphasis omitted). Thus, Patent Owner concludes, “claim 14 recites a distinction between (1) encoded signal portions and (2) signal portions that are substantially unmodified.” *Id.* at 13 (emphasis omitted).

Petitioner agrees with Patent Owner that “the ’695 patent uses the term ‘substantially unmodified’ to differentiate signal portions that are not encoded or decoded from those that are.” Reply 2–3 (citing Ex. 1001, 4:9–12 (“the encoder can apply an encoded digital information signal or a substantially unmodified digital information signal to the output”)); *id.* at 4:45–47 (“the encoding unit 6 supplies a signal to the output 10 of the encoding unit 6 in an encoded form or in a substantially unmodified form”); *id.* at 6:44–48 (signal applied to output 80 of the decoding unit 76 is either a “decoded signal” or a “substantially unmodified” version of the input signal)). Thus, Petitioner contends, the term “substantially unmodified” in claim 14 refers to signal portions that simply pass through the decoding means (i.e., “not decoded”) from portions that are decoded. Reply 2.

In light of the foregoing usage in the Specification and the parties’ consensus regarding the scope of term, we construe the term “substantially unmodified” to mean “not modified,” such that, in the context of independent claim 14, the term denotes signals that are not decoded.

4. *Limitation 14d: a control signal of the first type depending on the first identification signal of the first type*

Patent Owner seeks construction of the term “depending upon,” because, according to Patent Owner, “what Petitioners identify as the ‘control signal of the first type’ in Green and Blue is *independent* of what they identify as the ‘first identification signal of the first type.’”

PO Resp. 13–14 (emphasis added). Because our analysis below reaches only the grounds of unpatentability based on Venbrux—not the grounds based on Green and Blue—and the parties do not dispute whether Venbrux meets this limitation, we decline to construe this term. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (explaining that only claim terms in controversy need to be construed, and only to the extent necessary to resolve the controversy).

D. Asserted Obviousness of Claims 14 and 15 over Venbrux

1. Overview of Venbrux

Venbrux is a journal article that “describes the first complete chip set implementation of the Rice algorithm and is designed to perform high-speed, adaptive, lossless compression and decompression.” Ex. 1005, 381.

Venbrux discloses an encoder and decoder chip set implementation, using distinct encoding schemes for different blocks of data. *Id.* The Rice algorithm aims to maximize the efficiency of data transmission by selecting, for each block of data, the encoding option that provides the best compression for that block. *Id.* at 382–83. As described in Venbrux, the Rice algorithm architecture includes a “default” coding option that does not encode the data. *Id.* Figure 7 of Venbrux is reproduced below.

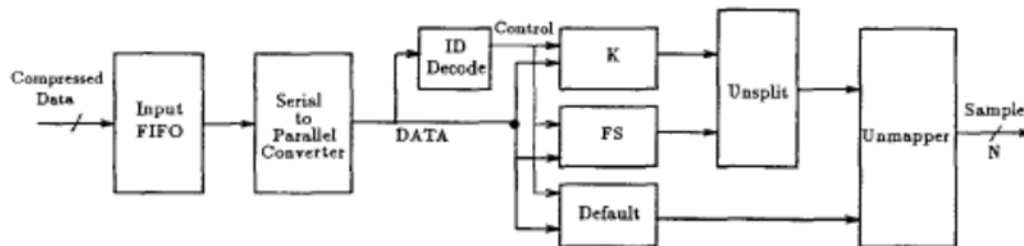


Fig. 7. Decoder block diagram.

Figure 7 depicts a block diagram of Venbrux's Universal Source Decoder. Venbrux describes its decoder as performing the reverse of Venbrux's encoder. *Id.* at 385. According to Venbrux:

The main decoding section includes three pipelines. If a block is coded by FS and k splits, then the FS data are routed to the FS pipeline for decoding and the k splits are routed to the k split pipeline. Likewise, if the block of data is default, the data would be routed to the default pipeline.

Id. Thereafter, “[d]efault data, as well as concatenated sigma data, are then sent to the unmapper, which performs the reverse of the mapping function along with the reverse of DPCM. The decoded data are available at the output of the unmapper section.” *Id.*

2. *Status of Venbrux as Prior Art*

Petitioner offers the declaration of Ms. S. Rampersad (Ex. 1008, “Rampersad Declaration”) in support of its assertion that Venbrux constitutes prior art to the '695 patent because it is a printed publication that was publically accessible no later than December 1992. Pet. 15 (citing Ex. 1008). During the trial, Petitioner did not make Ms. Rampersad available for deposition, but instead made Ms. Rampersad's supervisor, Nigel Spencer, available for deposition. PO Resp. 50; Reply; Exs. 1033–1035, 2020–2025. Patent Owner declined to depose Mr. Spencer. Ex. 1035; *see also* Tr. 32:17–33:11. Because Petitioner did not offer Ms. Rampersad for deposition, Patent Owner asserts that “[t]he Rampersad declaration therefore should be given no weight.” PO Resp. 50. Significantly, however, Patent Owner does not dispute that Venbrux constitutes prior art to the '695 patent. *Id.*

We do not rely on the Rampersad Declaration to establish Venbrux's status as prior art to the '695 patent. Rather, we rely on Venbrux's substantial indicia of publication, namely its header indicating Venbrux is a journal article included in "IEEE Transactions on Circuits and Systems for Video Technology, Vol. 2, No. 4, December 1992" and its footer reciting a 1992 IEEE copyright date. Ex. 1005; *Palo Alto Networks, Inc. v. Finjan, Inc.*, IPR2015-01979, Paper 62 at 22–25 (PTAB Mar. 15, 1997) (crediting indicia of publication on article in ACM journal); *Microsoft Corp. v. Bradium Techs. LLC*, IPR2016-00449, Paper 9 at 13 (PTAB July 27, 2016) (noting generally that "IEEE publications, such as the one in which Reddy appeared, are distributed widely and intended to be accessible to the public"). We further rely on the testimony of Patent Owner's declarant Dr. Boncelet that the particular series of journals in which Venbrux appears, *IEEE Transactions*, is long-established and well-known. Ex. 1032, 11:9–13:7. In light of the foregoing evidence, we determine that Petitioner has met its burden to establish that Venbrux constitutes prior art to the '695 patent, which Patent Owner does not dispute in the record before us.

3. *Independent claim 14*

Petitioner, relying on the Castleman Declarations, asserts Venbrux renders obvious claim 14 in the following manner. Pet. 59–68 (citing Ex. 1002 ¶¶ 156–176). Petitioner identifies Venbrux's "decompression end of the system" as the claimed receiving means. *Id.* at 61–62. In particular, Petitioner identifies Venbrux's receiver "un-packer" block, depicted in Figure 12, as receiving a composite signal. *Id.* at 62. Figure 12, as annotated by Petitioner, is reproduced below.

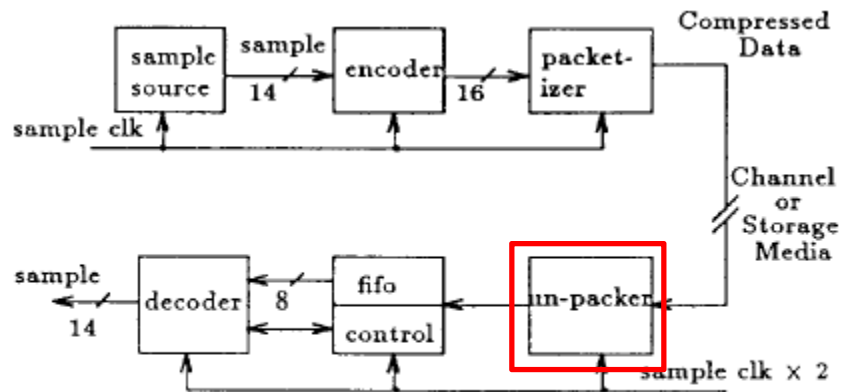


Fig. 12. System diagram for image compression.

Figure 12 is a system diagram for image compression, showing Venbrux’s receiver “un-packer” block receiving compressed data via a channel or storage media. Petitioner further asserts the claimed “demultiplexing means for deriving at least one signal portion from the composite signal and for deriving a first identification signal of a first type and a second type from the composite signal” is taught or suggested by Venbrux’s decoder. Pet. 63. Venbrux describes that “[b]efore processed data are sent out, ID bits are prepended to inform the decoder which of the code options have been used to compress the block of data.” Ex. 1005, 383. Thus, the composite signal received includes ID bits and data. *Id.* Once received, Venbrux states that its ID Decode unit within its decoder then decodes “the ID bits in order to direct data to the pipeline that is to decode the data.” *Id.* at 385. Figure 7 of Venbrux, depicting the block diagram of the decoder including the ID Decode unit, is reproduced below.

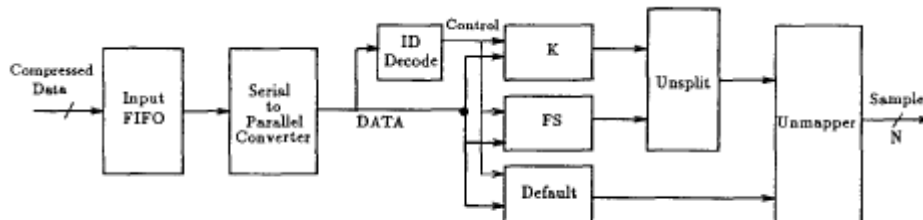


Fig. 7. Decoder block diagram.

Figure 7 is a block diagram of Venbrux's Universal Source Decoder, including the ID Decode unit. Thus, Petitioner asserts, "[t]he ID bits, which are different for the different types of compression options, are [the claimed] 'a first identification signal of a first type and a second type [derived] from the composite signal.'" Pet. 64.

Petitioner and Dr. Castleman rely on Venbrux's ID Decode unit as meeting the claimed decoding means. Pet. 64–66 (citing Ex. 1002 ¶ 172); Reply 4–6 (citing Ex. 1031 ¶ 17). In particular, Petitioner and Dr. Castleman state "that the 'Control' signals generated by the 'ID Decode' unit are signals that 'direct data to the pipeline that is to decode the data' or to the default path." Pet. 65 (citing Ex. 1005, 385). Thus, Petitioner contends, Venbrux's Control signal meets the claimed control signal. *Id.*

As to the claimed "supplying a signal portion as a portion of the digital information signal in a substantially unmodified form depending on a control signal of a second type," Venbrux describes data being routed according to the control signal from the ID Decode unit to three pipelines: two decoder paths, *k* and FS respectively, as well as a third default path, wherein data is not decoded. Ex. 1005, 385 ("If a block is coded by FS and *k* splits, then the FS data are routed to the FS pipeline for decoding and the *k* splits are routed to the *k* split pipeline. Likewise, if the block of data is default, the data would be routed to the default pipeline."). Relying on the foregoing disclosure, Petitioner asserts Venbrux's control signal supplies "a portion of the digital information signal in a substantially unmodified form," as claimed, by routing data to the default pipeline, which does not decode the data. Pet. 65–66.

Finally, with regard to the claimed means for generating the control signal, Venbrux teaches that “[d]ecoding a block of data includes the following steps: . . . [d]ecoding the ID bits in order to direct data to the pipeline that is to decode the data.” Pet. 67 (citing Ex. 1005, 385). Petitioner asserts Venbrux thus meets the claimed means for generating because “[t]he ID Decode unit generates a ‘Control’ signal after it decodes these ID bits.” *Id.*

In response to Petitioner’s challenge, Patent Owner contends that Petitioner fails to identify decoding means for supplying a signal portion in a substantially unmodified form depending on a control signal of a second type, as recited in limitation 14c. PO Resp. 41–48. According to Patent Owner, “Venbrux’s decoder includes an unmapper that modifies the signal” and therefore does not supply a signal portion in substantially unmodified form, as claimed. *Id.* at 42. More specifically, Patent Owner contends “that the output of Venbrux’s Fig. 7 ‘Unmapper,’ which reverses the mapping function, is quite different and not ‘substantially unmodified’ as compared to the input to Venbrux’s Fig. 7 ‘Decoder,’ and that “[t]his is true even in the case when the ‘Default’ decoder path in Fig. 7 is utilized.” *Id.* at 47 (citing Ex. 2016 ¶¶ 179–180).

Having considered the complete trial record, we agree with Petitioner that Venbrux teaches or suggests all the limitations of claim 14 based on the factual findings set forth above, which we adopt as our own. See Pet. 59–68 (citing Ex. 1002 ¶¶ 156–176); Reply 4–10. Patent Owner’s focus on the Unmapper is misplaced. Above, we construed the term “substantially unmodified” to mean “not modified” such that, in the context of independent claim 14, the term denotes signals that are not decoded. See *supra* Section

III.C.3. Applying our construction, we agree with Petitioner that Venbrux's ID Decode unit supplies a signal portion in substantially unmodified form. In particular, data routed based on the control signal and passed through the default pipeline instead of the decoder pipelines *k* and FS is not decoded before being provided to Venbrux's unmapper. Ex. 1005, 385 ("If a block is coded by FS and *k* splits, then the FS data are routed to the FS pipeline for decoding and the *k* splits are routed to the *k* split pipeline. Likewise, if the block of data is default, the data would be routed to the default pipeline."); see also Pet. 64–66 (citing Ex. 1002 ¶¶ 170–172). Additionally, when discussing the encoding of data before transmission to the receiver, Venbrux describes that the "Default" option included in the options of its "Entropy Coder" is to not encode the data. Ex. 1005, 383. "ID bits are prepended to inform the decoder which of the code options have been used to compress the block of data." *Id.* In light of these teachings, we agree with Petitioner and Dr. Castleman that using the Control signal output by the ID Decode unit to direct data to the default path would have been obvious because the Control signal is the only signal that could direct data and control to which pipeline a particular block of data should be directed for decoding. Pet. 65 (citing Ex. 1002 ¶ 172; Ex. 1005, 385, Fig. 7). We agree, therefore, with Petitioner and Dr. Castleman that "it would have been obvious to route a block of encoded data to the FS or *k* split pipelines, *id.* at 385, depending on a Control signal output from the ID Decode unit indicating that those encoding options had been used for the data, [and further that] it would have been obvious to route a block of non-encoded default data to the default pipeline, *id.* at 385, depending on a Control signal output from the ID

Decode unit indicating that the default option had been used for the data.”
Pet. 66; Ex. 1002 ¶ 172.

We are not persuaded by Patent Owner’s arguments to the contrary, namely that Petitioner and Dr. Castleman rely on Venbrux’s unmapper and that the output of Venbrux’s unmapper does not meet the claimed signal portion in substantially unmodified form. PO Resp. 41–48; Paper 44, 1–7. Patent Owner’s argument that Petitioner and Dr. Castleman rely on Venbrux’s unmapper is unsupported by the Petition itself. When analyzing the decoding means recited in limitation 14c, Petitioner begins its analysis by excerpting the relevant portion of Venbrux’s Figure 7. Pet. 64–65. The portion of Figure 7 excerpted by Petitioner is reproduced below.

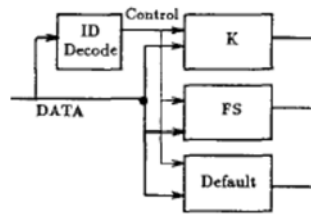


Fig. 7. Decoder block diagram.

Petitioner describes, and we agree, that the excerpted portion of Figure 7 “shows that the decoder in Venbrux uses a ‘Control’ signal from the ID decode unit to determine which of the decode paths should process the data.” Pet. 64 (citing Ex. 1005, 385). Petitioner proceeds to map the functions of Venbrux’s ID decode unit and control signal to the claimed decoding means. *Id.* at 65–66. Significantly, Patent Owner fails to cite any portion of the Petition in support of its argument, instead relying on: (i) bolding applied by Dr. Castleman in his first declaration to a quoted passage of Venbrux stating that after passing through the default pipeline, data is sent to the unmapper and (ii) a JPEG decoder discussed in Dr. Castleman’s second declaration.

PO Resp. 41–48; Paper 44, 1–7. These portions of Dr. Castleman’s declarations, however, do not modify Petitioner’s clear analysis in the Petition of the claimed decoding means in Venbrux.

Patent Owner’s argument that the output of Venbrux’s unmapper is not “substantially unmodified,” is unpersuasive because it is of no moment to the inquiry at hand. Patent Owner cites Venbrux’s Figure 8, reproduced below, in support of its argument (PO Resp. 44):

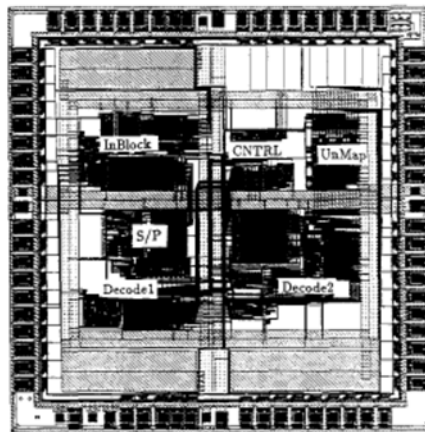


Fig. 8. Decoder chip plot.

Figure 8 depicts the physical structure of Venbrux’s Universal Source Decoder chipset. *Id.* (citing Ex. 1005, 385). Although Patent Owner is correct that the entire chipset of Venbrux is referred to as “Universal Source Decoder” and includes the unmapper, it is readily apparent from Figure 8 that the unmapper is a separate and distinct physical structure from the control and decoding pipelines relied upon by Petitioner as meeting the decoding means. Patent Owner, relying on Dr. Boncelet, contends the unmapper is a necessary portion of the Universal Source Decoder because it reverses the mapping applied by Venbrux’s pre-processor. PO. Resp. 44–47 (citing Ex. 2016 ¶¶ 170–175). But Venbrux describes this mapping is applied before data is provided to the Entropy Coder for coding or default

non-encoding. Ex. 1005, 383, Fig. 3. The applied mapping is then reversed after passing through the decoding pipelines or default non-decoding pipeline. Ex. 1005, 385 (“If a block is coded by FS and k splits, then the FS data are routed to the FS pipeline for decoding and the k splits are routed to the k split pipeline. Likewise, if the block of data is default, the data would be routed to the default pipeline. . . . Default data, as well as concatenated sigma data, are then sent to the unmapper, which performs the reverse of the mapping function along with the reverse of the DPCM.”).

Nothing in claim 14 precludes unmapping the signal after it is output by the decoding means. When questioned on this point, Patent Owner’s counsel was unable to identify any such limitation of claim 14. Tr. 29:21–30:24. Indeed, claim 14 recites the opposite scope. Claim 14 recites, “A receiver comprising. . . .” The transition “comprising” in an apparatus claim indicates that the claim is open-ended and allows for additional elements. *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501 (Fed. Cir. 1997) (“Comprising” is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim.). The presence of an additional unmapper beyond Venbrux’s ID decode unit and decoding pipelines, therefore, is not excluded by the scope of claim 14.

Accordingly, we determine Petitioner has shown by a preponderance of the evidence that claim 14 is rendered obvious by Venbrux.

4. *Dependent claim 15*

Petitioner’s analysis of dependent claim 15 refers back to its corresponding analysis of claim 14 and further identifies structures recited by Venbrux meeting the relevant claim limitations. Pet. 68–69. In

particular, Petitioner and Dr. Castleman assert, and we agree, that “[i]t would have been obvious to generate a Control signal output from the ID Decode unit indicating that the default option had been selected for the data, see [Ex. 1005,] 383, depending on ID bits indicating that the default option had been used (“generat[ing] a control signal of the second type depending on the first identification signal of the second type”). *Id.* at 69 (citing Ex. 1002 ¶¶ 181–182).

Having considered the complete trial record, we agree with Petitioner that Venbrux teaches or suggests all the limitations of claim 15 based on the factual findings set forth above, which we adopt as our own. *See* Pet. 68–69 (citing Ex. 1002 ¶¶ 177–182). Patent Owner does not address claim 15 beyond its arguments on claim 14. *See* PO. Resp. 41–50. Accordingly, we determine Petitioner has shown by a preponderance of the evidence that Venbrux renders obvious claim 15.

E. Asserted Obviousness of Claim 17 over Venbrux and Bliss

1. Overview of Bliss

Bliss discloses a disk storage system that performs channel decoding, error detection, and error correction of compressed data. Ex. 1006, 2:41–57, Abst. Figure 2 of Bliss is reproduced below.

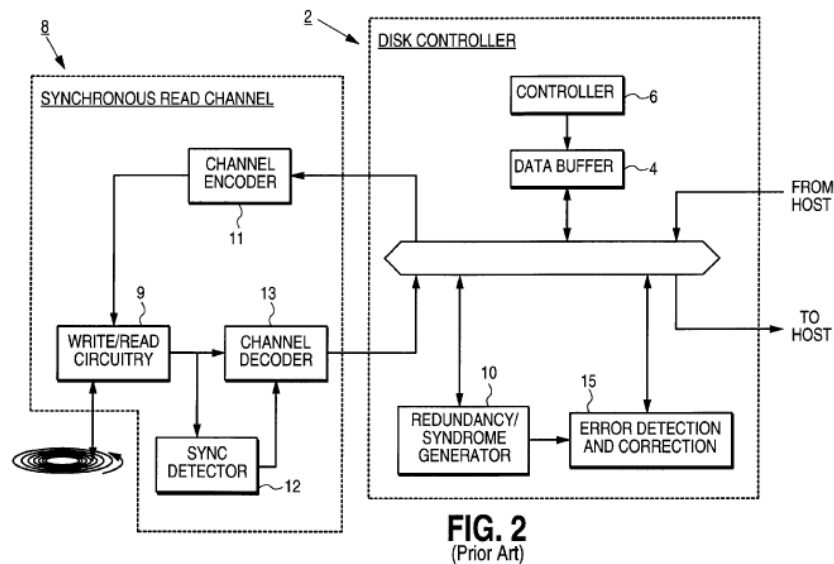


Figure 2 depicts a prior art storage system that includes a “channel decoder” and an “error detection and correction” unit. *Id.* at 4:56–60.

2. Dependent Claim 17

Petitioner contends that Venbrux and Bliss together render obvious claim 17. Pet. 69–74. More specifically, Petitioner relies on its analysis of Venbrux as meeting the claim limitations of claim 14 inherited by claim 17. *Id.* at 71. With regard to limitation 17a, Petitioner alternatively identifies Venbrux’s storage media and Bliss’ write/read circuitry 9 as meeting this limitation. *Id.* at 72–73. Petitioner further contends that Venbrux’s decoder meets the error detection/correction means recited in limitation 17c. *Id.* at 73. Petitioner alternatively asserts that Bliss discloses both a “channel decoding means” and “error detection/correction means.” *Id.* at 74; *see also* Ex. 1006, Fig. 2. Petitioner’s analysis, as supported by the Castleman Declaration, thus demonstrates where Petitioner contends each element of claim 15 is taught or suggested in Venbrux. Pet. 69–74 (citing Ex. 1002 ¶¶ 183–202). Relying on Dr. Castleman’s testimony, Petitioner states one of ordinary skill in the art would have been motivated to combine the teachings

of Venbrux and Bliss because: (i) “channel decoders and error detection/correction units were well known at the time the ’695 patent was filed”; (ii) “Venbrux and Bliss are directed to the common objective of reading encoded data from storage media”; and (iii) such a person would perceive the “value of adding channel decoder and error detection/correction to Venbrux.” Pet. 53, 70–71; Ex. 1002 ¶¶ 184–190.

Having considered the complete trial record, we agree with Petitioner that Venbrux and Bliss together render obvious claim 17. In particular, we agree with Petitioner and Dr. Castleman that an artisan of ordinary skill “would have understood Venbrux’s reference to “storage media” used for compressed data to refer to widely-used magnetic or optical media (e.g., hard disks and CDs, respectively),” thereby meeting limitation 17a (a device for reading out a signal recorded on a record carrier). Pet. 72 (citing Ex. 1002 ¶ 194). We also agree, alternatively, that that an ordinarily skilled artisan would have incorporated Bliss’s disclosure of write/read circuitry 9 “into Venbrux’s receiver to allow the receiver to read compressed data from storage media” and that this incorporation would meet limitation 17a. *Id.* at 73 (citing Ex. 1002 ¶¶ 195–196). Petitioner further contends, and we agree, that Venbrux’s decoder meets the error detection/correction means recited in limitation 17c and, alternatively, that Bliss discloses both “channel decoding means,” recited in limitation 17b, and “error detection/correction means,” recited in limitation 17c. *Id.* at 73–74 (citing Ex. 1002 ¶¶ 199, 202); *see also* Ex. 1006, Fig. 2.

Patent Owner does not address claim 17 beyond its arguments on claim 14. *See* PO. Resp. 41–50. Accordingly, we determine Petitioner has

shown by a preponderance of the evidence that Venbrux and Bliss together render obvious claim 17.

F. Remaining Grounds of Unpatentability

Having found claims 14 and 15 unpatentable over Venbrux and claim 17 unpatentable over Venbrux and Bliss, we do not reach Petitioner's additional challenges to these claims, as set forth in the Petition, relying on the Green, Blue, and Clark references.

IV. PETITIONER'S MOTION TO SUBMIT
SUPPLEMENTAL INFORMATION

Petitioner moves to submit supplemental Exhibits 1021–1028. Paper 14. According to Petitioner, “Supplemental Exhibits 1021–1025 provide corroborating evidence that Venbrux was publicly available by December 15, 1992.” *Id.* at 2. We dismiss as moot Petitioner's motion as to supplemental Exhibits 1026–1028 because we do not reach Petitioner's arguments on the Green and Blue references. *See supra* Section. III.F.

Petitioner further asserts, “Supplemental Exhibits 1026–1028 further confirm the public availability of the Green and Blue CCSDS references as being distributed on the Internet in 1997.” *Id.* at 3. We dismiss as moot Petitioner's motion as to supplemental Exhibits 1021–1025 because even without including these exhibits, Petitioner has established that Venbrux constitutes prior art to the '695 patent. *See supra* Section III.D.2.

V. PETITIONER'S MOTION TO EXCLUDE

Petitioner moves to exclude Patent Owner's Exhibits 2026 and 2027, which purport to be a dictionary definitions, on the basis that they: (1) are untimely submitted “during the post-Petitioner Reply deposition of

Petitioners' expert Dr. Castleman," (2) constitute hearsay not subject to the exceptions of Federal Rules of Evidence 803, 804, or 807, and (3) are unauthenticated under Federal Rule of Evidence 901. Paper 38, 1–3. We dismiss as moot Petitioner's motion to exclude Exhibits 2026 and 2027 because even without excluding these exhibits, Petitioner has shown by a preponderance of the evidence that claims 14, 15, and 17 of the '695 patent are unpatentable. *See supra* Sections III.D–E.

VI. PATENT OWNER'S MOTION TO EXCLUDE

Patent Owner moves to exclude Petitioner's Exhibit 1008, the Rampersad declaration, on the basis that Petitioner failed to make the declarant available for deposition. Paper 35, 1–6. We dismiss as moot Patent Owner's motion because even without excluding Exhibit 1008, Petitioner has established that Venbrux constitutes prior art to the '695 patent. *See supra* Section III.D.2.

VII. SUMMARY

Petitioner has shown by a preponderance of the evidence that:

Claims 14 and 15 are unpatentable under 35 U.S.C. § 103(a) over Venbrux; and

Claim 17 is unpatentable under 35 U.S.C. § 103(a) over Venbrux and Bliss.

VIII. ORDER

It is, therefore,
ORDERED that claims 14, 15, and 17 of the '695 patent are unpatentable;

FURTHER ORDERED that Petitioner's Motion to Submit Supplemental Information is *dismissed* as moot;

FURTHER ORDERED that Petitioner's Motion to Exclude is *dismissed* as moot;

FURTHER ORDERED that Patent Owner's Motion to Exclude is *dismissed* as moot; and

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

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