

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HYTERA COMMUNICATIONS CO. LTD.,
Petitioner,

v.

MOTOROLA SOLUTIONS, INC.,
Patent Owner.

Case IPR2017-02183
Patent 8,279,991 B2

Before TREVOR M. JEFFERSON, DANIEL N. FISHMAN, and
PATRICK M. BOUCHER, *Administrative Patent Judges*.

JEFFERSON, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background

We instituted an *inter partes* review of claims 7 and 8 of U.S. Patent No. 8,279,991 B2 (Ex. 1001, “the ’991 patent”) in response to a petition (Paper 1, “Pet.”) filed by Hytera Communications Corp. Ltd. (“Petitioner”)¹. Paper 7 (“Dec.”). Motorola Solutions, Inc. (“Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”) prior to institution. Following institution, Patent Owner filed a Response (Paper 22, “PO Resp.”) to which Petitioner filed a Reply (Paper 33, “Reply”) and Patent Owner filed an authorized Sur-Reply (Paper 42, “PO Sur-Reply”). Petitioner filed a Motion to Exclude evidence filed by Patent Owner, which Patent Owner opposed, and to which Petitioner replied. Papers 40, 43, 45. An oral hearing was held with the parties, and a copy of the transcript was entered into the record. Paper 46 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of the claims on which we instituted trial. Based on the record before us, Petitioner has not shown, by a preponderance of the evidence, that claims 7 and 8 of the ’991 patent are unpatentable.

B. Related Proceeding

Both parties identify *In the Matter of Certain Two-Way Radio Equipment and Systems, Related Software and Components Thereof*, 337-TA-1053 (ITC), and *Motorola Solutions, Inc. v. Hytera Communications*

¹ Petitioner identifies Hytera America, Inc., and Hytera Communications America (West), Inc. as additional real parties in interest. Pet. 48.

Corp. Ltd., No. 1:17-cv-01972 (N.D. Ill.), as related proceedings. Pet. 48; Paper 5, 1.

C. The '991 Patent (Ex. 1001)

The '991 patent, entitled “Method of Efficiently Synchronizing to a Desired Timeslot in a Time Division Multiple Access Communication System,” describes methods for transmitting communications in a Time Division Multiple Access Communication (“TDMA”) system to enable efficient use of resources in the TDMA system. Ex. 1001, 3:17–21, 3:58–62. TDMA air interface protocol is described in a European Telecommunications Standard Institute—Digital Mobile Radio (ETSI-DMR) standard (ETSI TS 102 361-1). *Id.* at 1:36–38. A subscriber unit in a TDMA communication system must ensure it is synchronized with a desired timeslot before it can receive or transmit data on a TDMA frequency channel. *Id.* at 1:38–41. The '991 patent describes that “the ETSI-DMR standard provides a TDMA Channel (TC) bit which informs the receiving device whether the next timeslot to be received is timeslot 1 or timeslot 2.” *Id.* at 1:41–43.

The '991 patent

discloses a method for efficiently synchronizing to a desired timeslot in a TDMA communication system. In repeater-based transmissions, the present disclosure reduces the time required for the receiving device to synchronize to the desired timeslot, thus eliminating the extra time needed to reliably decode the TC bits in the CACH message, as described [in existing TDMC protocol].

Id. at 3:15–22. Figure 7, below, illustrates a timing diagram of two direct-mode transmissions in accordance with the '991 patent.

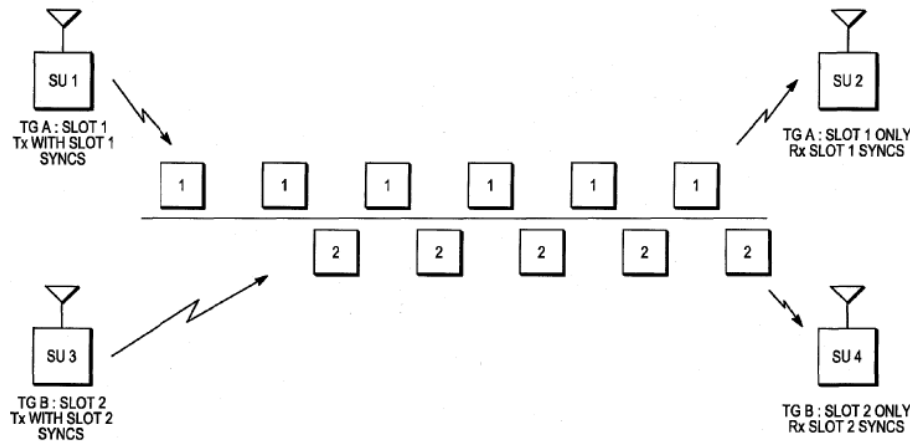


FIG. 7

Figure 7 depicts a system with two timeslots per frequency channel for individual communications. The '991 patent states that in Figure 7

two transmissions are currently being transmitted by two transmitting subscriber units on a single frequency (e.g., 12.5 kHz channel bandwidth with 2:1 TDMA slotting structure for 6.25e spectral efficiency) in separate timeslots. Transmitting subscriber unit 1 is transmitting bursts in its transmission that have an embedded synchronization pattern associated with Timeslot 1, where appropriate; transmitting subscriber unit 3 is transmitting bursts in its transmission that have an embedded synchronization pattern associated with Timeslot 2, where appropriate. Once the synchronization patterns are detected by the receiving subscriber units 2 and 4, respectively, the receiving subscriber units 2 and 4 immediately know they have synchronized to their desired timeslots.

Id. at 11:29–42.

The '991 patent discloses methods for a transmitting device to transmit bursts containing voice, data, or control information in different timeslots using different synchronization patterns associated with the timeslots, as well as methods for a receiving device to synchronize to a

desired timeslot. *Id.* at Figs. 2–6. The '991 patent explains that the transmitting device knows a set of synchronization patterns associated with each timeslot on a frequency. *Id.* at 5:25–26, 9:33–40. Each set of synchronization patterns “can be a set of one or greater,” such that the set may comprise “one synchronization pattern associated with the timeslot” or may have a plurality of synchronization patterns that differentiate between the source and/or payload-type for bursts transmitted on that timeslot. *Id.* at 5:45–65, 9:47–60, 9:64–10:9. The '991 Specification describes a “two slot TDMA communication system” in which the transmitting device knows a different set of synchronization patterns associated with each of the two timeslots on a frequency, each set comprising at least two synchronization patterns. *Id.* at 5:56–65 (synchronization patterns associated with timeslot 1, including “BS_Sourced_Data_TS1=DFF57D75DF5D₁₆”, “BS_Sourced_Voice_TS1=755FD7DF75F7₁₆”), 6:27–34 (synchronization patterns associated with timeslot 2, including “BS_Sourced_Data_TS2 = DD7FF5D757DD₁₆”, “BS_Sourced_Voice_TS2=77D55F7DFD77₁₆”).

The '991 patent describes that “[i]n a repeater-based transmission, a transmitting device selects a synchronization pattern associated with the desired timeslot” *Id.* at 3:21–23. “If the receiving device detects the synchronization pattern, the receiving device immediately synchronizes with the timeslot with confidence that it is synchronizing to the desired timeslot, or can immediately adjust its timing in order to decode the desired timeslot, without needing extra time to reliably decode the TC bits in the CACH.” *Id.* at 3:31–37. In order to transmit bursts, a device prepares to transmit in a timeslot (such as Timeslot 1, Timeslot 2, a rest timeslot, or a non-rest

timeslot), selects a synchronization pattern from a set of patterns associated with that timeslot, and transmits the burst having the selected synchronization pattern. *Id.* at 5:32–44, 5:66–6:40, 9:39–47, 9:61–64, 10:10–17.

The receiving device (mobile) tunes to a frequency associated with a selected channel and searches for a synchronization pattern associated with a desired timeslot (e.g., timeslot 1). *Id.* at 7:22–26, 10:52–56. If the receiving device detects the synchronization pattern associated with the desired timeslot (e.g., timeslot 1), the receiving device synchronizes to the timeslot on which the synchronization pattern was detected. *Id.* at 7:53–62, 8:3–16, 10:59–66.

D. Challenged Claims

We instituted review of Petitioner’s challenges to independent claim 7 and dependent claim 8 of the ’991 patent, reproduced below:

7. In a time division multiple access (TDMA) system having a plurality of timeslots, a method comprises the steps of:

[a] knowing a first set of synchronization patterns associated with a desired timeslot and a second set of synchronization patterns associated with each of the other timeslots in the TDMA system, wherein the first set of synchronization patterns is mutually exclusive from the second set of synchronization patterns, and each set comprising at least two different synchronization patterns as a function of at least one of a payload type and a source of the transmission;

[b] preparing to transmit a particular payload type in a timeslot;

[c] determining whether the timeslot is a current desired timeslot for the TDMA system;

[d] if the timeslot is the current desired timeslot, selecting a synchronization pattern selected from the first set of synchronization patterns based on the one of the particular payload type and a particular source of the transmission; otherwise selecting a synchronization pattern selected from the second set of synchronization patterns based on the one of the particular payload type and the particular source of the transmission; and

[e] transmitting a burst in the timeslot having embedded the synchronization pattern that was selected.

8. The method of claim 7 wherein the current desired timeslot at a first time is different than the current desired timeslot at a second time.

Ex. 1001, 17:35–63 (bracketed lettering added).

E. Alleged Grounds of Unpatentability

We instituted trial on independent claim 7 and dependent claim 8 of the '991 patent on the following grounds. Dec. 20; *see* Pet. 5:

References	Basis	Claims Challenged
Yamaguchi, ² ETSI Standard, ³ and Zak ⁴	35 U.S.C. § 103(a)	7 and 8
ETSI Standard and Zak	35 U.S.C. § 103(a)	7 and 8
Yamaguchi, Wiatrowski, ⁵ and Zak	35 U.S.C. § 103(a)	7 and 8

² U.S. Pat. No. 5,761,211 issued June 2, 1998 to Yamaguchi et al. (Ex. 1005, “Yamaguchi”).

³ *Electromagnetic compatibility and Radio spectrum Matters (ERM): Technical Requirements for Digital Mobile Radio (DMR); Part 1: Air Interface (AI) protocol*, ETSI TS 102 361-1 v1.1.1 (2005–04) (Ex. 1006, “ETSI Standard”).

⁴ U.S. Pat. No. 6,452,991 B1 issued Sept. 17, 2002 to Zak (Ex. 1007, “Zak”).

⁵ U.S. Pat. Pub. No. 2006/0013188 A1 published Jan. 19, 2006 to Wiatrowski et al. (Ex. 1008, “Wiatrowski”).

II. ANALYSIS

A. Legal Standard

A patent 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 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 ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)); see *In re Warsaw Orthopedic, Inc.*, 832 F.3d 1327, 1333 (Fed. Cir. 2016) (citing *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006)).

To prevail on its challenges, 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). “In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d

1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden never shifts to Patent Owner. See *Dynamic Drinkware, LLC v. National Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner does not 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).

B. Level of Skill in the Art

Petitioner contends that a person of ordinary skill in the art “would have had a Bachelor’s degree in electrical engineering, computer engineering, or computer science, or a related field, along with at least two to three years of experience in telecommunications and networking, or an equivalent degree and/or experience.” Pet. 9. According to Petitioner, “[a]dditional education might compensate for a deficiency in experience, and vice-versa.” *Id.* at 10.

Patent Owner does not advocate for a particular level of skill in the art in its Response, but Patent Owner’s declarant, Dr. Stephen B. Wicker, sets forth a proposed level of skill that is similar to that advocated by Petitioner. Ex. 2008 ¶ 32. In light of that similarity, we see no compelling basis to deviate from Petitioner’s proposal and we adopt it for this Decision.

C. Claim Interpretation

For petitions filed prior to November 13, 2018, 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) (2017);⁶ *Cuozzo Speed Techs. LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). In applying a broadest reasonable construction, 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). Only those terms that are in controversy, however, need to be construed, and only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999); *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (applying *Vivid Techs.* in the context of an *inter partes* review).

Our Institution Decision adopted the constructions proposed by both parties in the related ITC proceedings (Ex. 1003, 10). Dec. 9; *see* Pet. 10-11; Prelim. Resp. 10–11.

Term (Claims)	Proposed Construction
[1] “knowing” (claim 7)	plain and ordinary meaning
[2] “a current desired timeslot” (claim 7)	“a current assigned timeslot”

⁶ The recent amendment to this rule does not apply here because the Petition was filed before November 13, 2018. *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018).

Term (Claims)	Proposed Construction
[3] “the first set of synchronization patterns is mutually exclusive from the second set of synchronization patterns” (claim 7)	“each synchronization pattern in the first set is not in the second set”
[4] “each set [of synchronization patterns] comprising at least two different synchronization patterns as a function of at least one of a payload type and a source of the transmission” (claim 7)	“each set of synchronization patterns has at least two different patterns that correspond to at least one of a payload type or transmission source”

The parties do not directly dispute these proposed constructions. *See* PO Resp. 8–11; Reply 2–3. Instead, the parties’ dispute revolves around whether the method of claim 7 (and its dependent claim 8) requires the steps to be performed in a specified order as written or in any order. *Id.* Because the parties offer no specific modifications to the constructions above, we adopt those constructions for this Decision. We address below the parties’ contentions regarding whether the claims require the steps of claim 7 to be performed in a particular order.

1. Steps in Method Claim Performed in Order

Steps in a method claim need not necessarily be performed in the order they are written, but if grammar, logic, the specification, or the prosecution history require the steps to be performed sequentially, then the claims are so limited. *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1369 (Fed. Cir. 2003); *Loral Fairchild Corp. v. Sony Corp.*, 181 F.3d 1313, 1322 (Fed. Cir. 1999) (“Although not every process claim is limited to the

performance of its steps in the order written, the language of the claim, the specification and the prosecution history support a limiting construction in this case.”).

Patent Owner argues that Petitioner’s implicit construction relies on the steps being performed in any order rather than the order written. PO Resp. 8 (citing Ex. 2007, 26:1–7 (arguing that Petitioner’s declarant, Dr. Robert Akl, did not consider whether the claim 7 required the steps in order)). Patent Owner argues that the language of the claims “requires performing the ‘preparing’ step [limitation 7[b]] before the ‘determining’ and ‘selecting’ steps” [limitation 7[c] and [d]]. PO Resp. 8–9. Specifically, Patent Owner relies on the antecedent basis in each step of claim 7 as shown in the emphasized claim language below:

Ex. 1001, cl. 7 (“[7a] knowing **a first set of** synchronization patterns . . . and **a second set of** synchronization patterns . . . [7b] preparing to transmit a particular payload type **in a timeslot**; [7c] determining whether **the timeslot** is **a current desired timeslot** for the TDMA system; [7d] if **the timeslot** is the **current desired timeslot**, **selecting** a synchronization pattern selected from **the first set** . . . otherwise selecting a synchronization pattern selected from **the second set** . . . [7e] transmitting a burst in **the timeslot** having embedded **the synchronization pattern** that was **selected**.”).

PO Resp. 9. Thus, Patent Owner argues that the antecedent basis of the claim language requires performing the steps 7[b] to 7[e] in the order in which they are written in the claim. *Id.* at 9–10 (citing *Wi-Lan, Inc. v. Apple, Inc.*, 811 F.3d 455, 462 (Fed. Cir. 2016); *Function Media, L.L.C. v. Google, Inc.*, 708 F.3d 1310, 1320 (Fed. Cir. 2013)).

Patent Owner further asserts that the '991 patent specification “uniformly confirms that the steps must be performed in order.” PO Resp. 10–11. Patent Owner refers to the embodiments of the invention, stating:

First, “the transmitting device **knows** a set of synchronization patterns associated with each timeslot on a frequency.” Ex. 1001 at 5:24–26; Ex. 2008 ¶ 67. Next, the “transmitting device **prepares** to transmit in Timeslot 1.” Ex. 1001 at 5:32–33; Ex. 2008 ¶ 67. After prepared to transmit, “the transmitting device **selects** a synchronization pattern from the set of synchronization patterns associated with Timeslot 1.” Ex. 1001 at 5:41–44; Ex. 2008 ¶ 67. Finally, the “transmitting device **transmits** the burst having embedded the [selected] synchronization pattern associated with Timeslot 1 that was selected.” Ex. 1001 at 5:66–6:4; Ex. 2008 ¶ 67. The same order is described with respect to the '991 patent's other embodiments. *See, e.g.*, Ex. 1001 at 9:33–43, 9:61–10:15; Fig. 5; Fig. 8; Ex. 2008, ¶ 68.

PO Resp. 10–11.

Petitioner disputes that any order is required because “both the Board and the Federal Circuit have held that method claims are not construed to require a specific order ‘unless the Specification or claims expressly or implicitly require the performance in that specific order.’” Reply 3 (quoting *Ex parte Li*, No. 2017-008638, slip op. at 4 (PTAB Jan. 18, 2018) (citing *Altiris*, 318 F.3d at 1369); *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1309 (Fed. Cir. 2014)). Petitioner relies on the general rule and does not make any specific argument with respect to the language of the claims. *Id.*

We begin by looking at the intrinsic evidence of the claim language and the specification to determine whether they expressly or implicitly require a specific order. *See Altiris*, 318 F.3d at 1369–70. Here, we agree with Patent Owner that the language shows that the results of a step are used

in the next step; that is, “step 7[b] ‘preparing to transmit a particular payload type in a timeslot’ [comes before] step 7[c] ‘determining whether the timeslot is a current desired timeslot for the TDMA system,’ because the transmitting device looks at the ‘the timeslot’ identified in the ‘preparing’ step to ‘determin[e]’ whether that timeslot is ‘a current desired timeslot.’” PO Sur-Reply 3–4 (quoting Ex. 1001, cl. 7).

With respect to the specification, the parties rely on different embodiments and draw competing conclusions. Patent Owner argues that Figure 5 of the ’991 patent, shown below, and the accompanying text confirm the order of method steps. PO Sur-Reply 5–6.

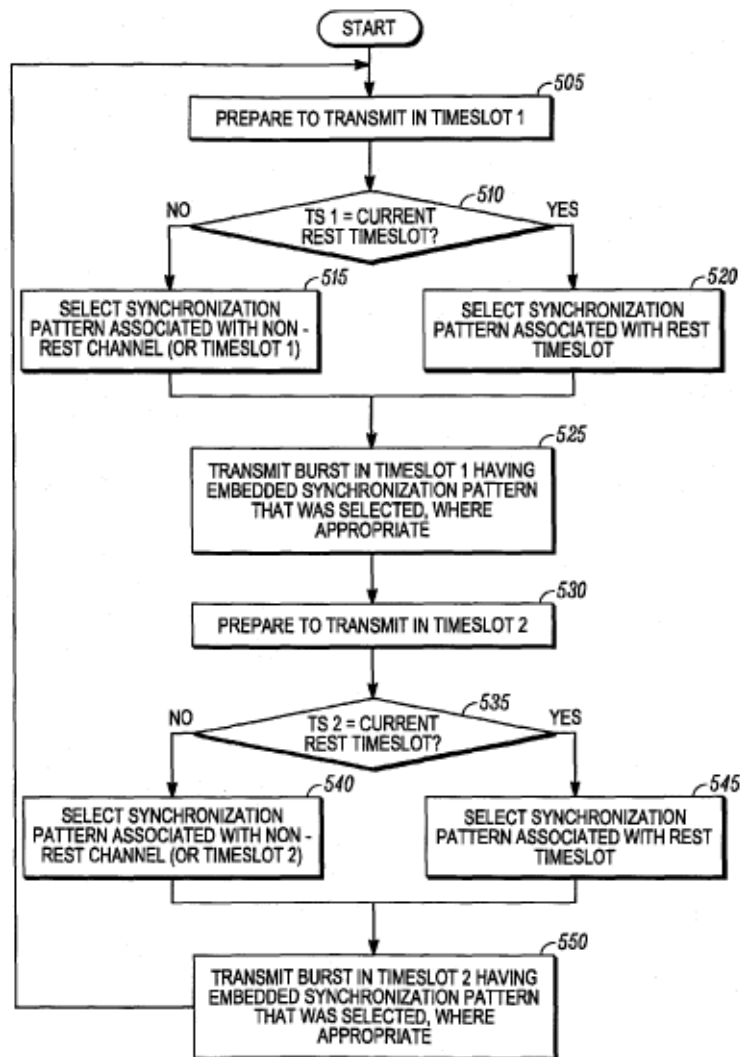


FIG. 5

Ex. 1001, Fig. 5. Figure 5 depicts “a flow diagram of an exemplary method of how a transmitting device transmits bursts using different synchronization patterns associated with a rest timeslot and a non-rest timeslot in accordance with an embodiment of the [’991 patent] disclosure.” Ex. 1001, 9:19–23. Patent Owner asserts that specification discussion of Figure 5 shows the preparing step (505) occurring before determining step (510), which occurs

before the selecting step (515). PO Sur-Reply 5–6 (citing Ex. 1001, 9:33–10:15; Ex. 1022, 219:2–18).

Petitioner argues that no specific order of the method steps is required because the specification does not expressly require it and the performing step does not technically require it. Reply 4. Petitioner also notes that the disclosure generally disclaims any strict relational order for the steps. *Id.* at 3 (citing Ex. 1001, 16:50–55). Petitioner draws support from Dr. Wicker’s admission that there is no explicit statement that prevents the determining step from occurring before the preparing step, nor anything technical requiring such an order. *Id.* at 4 (citing Ex. 1001, 5:32–44; Ex. 1022, 118:5–119:2, 126:21–24, 127:23–128:6, 201:17–25). With respect to the preparing step in Figure 2, Petitioner relies on an example of preparing to transmit on timeslot 1 for a repeater by setting the TC bit. Ex. 1001, 5:32–44; Reply 4; Ex. 1023 ¶ 36. Specifically, Petitioner argues that testimony shows there is no technical limitation that would prevent the determining step from occurring before the preparing step in claim 7. *See* Reply 4.

We are not persuaded by Petitioner’s argument and evidence that the specification’s technical reference to the “preparing” step with respect to Figure 2 negates the specification’s support for the order of steps in Figure 7 and its accompanying specification discussion. *See* Reply 4; Ex. 1023 ¶ 36; PO Sur-Reply 6. We are also not persuaded by Dr. Wicker’s testimony, as the lack of an explicit statement regarding the order or the technical implementation of the performing step in Figure 2 does not address persuasively Patent Owner’s arguments based on Figure 5. Reply 4; Ex. 1022, 118:5–119:2, 126:21–24, 127:23–128:6, 201:17–25.

We agree with Patent Owner’s argument that the ’991 patent embodiments depicted in Figures 5 and 8 show the enumerated steps being performed in sequence as claimed. PO Resp. 10–11 (citing Ex. 1001, 5:24–26, 5:32–33, 5:41–44, 5:66–6:4, Figs, 2, 5, 8); Ex. 2008 ¶¶ 67–68; PO Sur-Reply 5–7. Because the embodiment shown in Figure 2 of the ’991 patent lacks an express determining step, we also agree with Patent Owner that it is not as informative regarding the sequence of steps in claim 7. Reply 4; PO Sur-Reply 6. In contrast, Figure 5’s embodiment, which expressly describes determining and transmission in accordance with the plain language of claim 7, indicates that the steps are ordered as claimed. *See* Ex. 1001, 5:32–44, 9:33–10:15; Ex. 1022, 219:2–18; Reply 4; PO Sur-Reply 6. Finally, Petitioner’s reliance on a general disclaimer for “relational terms” is not specific to claim 7 nor is it definitive, as the cited text notes only that a specific relationship is not “necessarily required.” *See* Reply 3 (citing Ex. 1001, 16:50–55).

The case law cited by Petitioner also does not persuade us that no sequence is required based on an antecedent basis and the intrinsic evidence. In *Ex parte Li*, the Board rejected an implied antecedent basis because both the claim language and the specification did not support a specific order for the method steps. *Ex parte Li*, No. 2017-008638, slip op. at 4–5 (noting that neither the antecedent basis for “the application program” nor the reference to “replacement” of a prior step’s element was sufficient and that the

specification did not support a specific order).⁷ In the present case, the antecedent basis is express and not implied.

Based on the foregoing, we are persuaded by Patent Owner's argument that the plain language and the specification together indicate that the method of claim 7 requires the steps be performed in the recited order. PO Resp. 10–11; Ex. 2008 ¶¶ 67–68; PO Sur-Reply 5–7.

D. Cited Prior Art

1. Yamaguchi (Ex. 1005)

Yamaguchi discloses a timing recovery circuit that determines a timing offset for synchronizing transmitters and receivers in TDMA systems. Ex.1005, Abstract, 1:10–13, 2:10–20, 5:51–62. Yamaguchi discusses “a time-division multiple access (TDMA) signal of the type employed in the North American digital cellular system.” *Id.* at 2:11–13. Yamaguchi discloses that “[t]he signal is organized into frames of six time slots each, each slot comprising a synchronization pattern (SYNC) and data,” where “[e]ach synchronization pattern is designed to have . . . no significant correlation with the other synchronization patterns.” *Id.* at 2:10–20.

⁷ We note that the Federal Circuit in *Apple Inc. v. Motorola, Inc.*, also turned to both the plain meaning of the claim language (antecedent basis) and supporting specification to find that method claim at issue required a specific sequence. *See Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1309 (Fed. Cir. 2014), *overruled on other grounds by Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015).

2. ETSI Standard (Ex. 1006)

The ETSI Standard “contains technical requirements for Digital Mobile Radio (DMR) operating in the existing licensed land mobile service frequency bands.” Ex. 1006, 9. The ETSI Standard “describes a [] DMR system for [products] which employs a Time Division Multiple Access (TDMA) technology with a 2-slot TDMA solution and RF Carrier bandwidth of 12.5 kHz.” *Id.* at 13. In TDMA, “[s]lot formats, field definitions, and timing are defined for voice traffic, data traffic, and control [signaling].” *Id.* The ETSI Standard explains that the “burst” “represents the physical channel of a timeslot.” *Id.* at 15. The ETSI Standard discloses that “[b]ursts have either a synchronization pattern or an embedded [signaling] field located in the center of the burst” and “[d]ifferent SYNC patterns are used in voice bursts and data bursts to allow the receiver to differentiate between them.” *Id.* at 16. Also, “[d]ifferent SYNC patterns are used for inbound and outbound channels to help the receiver reject co-channel interference.” *Id.*

The ETSI Standard describes two types of TDMA frames—“MS sourced TDMA frame” and “BS Sourced TDMA frame.” *Id.* at 18 (Figure 4.4, and Figure 4.5). The MS sourced TDMA frame is used for MS sourced communications only, and the BS sourced TDMA frame is used for BS sourced communications only. *Id.*

3. Zak (Ex. 1007)

Zak discloses “systems and methods for locating a known multi-symbol syncword in a received signal” for use in systems requiring channel synchronization, such as time division multiple access communications

systems. Ex. 1007, Abstract, 1:7–11. Zak discloses that TDMA systems “divide communications resources among the terminals using the network,” and that in FDMA/TDMA cellular systems, the frequency sub-bands are “divided into up to six separate communications time slots.” *Id.* at 1:24–29. Zak explains that “[t]he users involved with a particular phone call in an ANSI-136 network access one of the available time slots on a specific frequency sub-band” so that “up to six separate calls may occur simultaneously on any given sub-band” because “the six sets of users share the sub-band by transmitting only during their assigned time slots.” *Id.*

To synchronize, the user terminals receive a signal identifying the location in that signal of “a predefined sequence of symbols which comprise a known synchronization word or ‘syncword.’” *Id.* at 6:21–40. And “a unique syncword is typically provided for each separate time slot in a frequency sub-band” such that, for each of the “frequency bands which carry communications into up to six separate time-multiplexed channels, six unique synchronization sequences are provided.” *Id.* at 6:21–40; *see id.* at 1:24–29, 1:34–36.

4. *Wiatrowski (Ex. 1008)*

Wiatrowski is a Motorola patent publication with common inventors with the ’991 patent, and is directed to a TDMA DMR system. Ex. 1008, 1. Wiatrowski states that “[o]nce the receiver is synchronized to a channel, the receiver uses pattern matching to detect the presence of a message that identifies whether the channel is present and synchronized.” *Id.* ¶ 15. “The message identifies the type of synchronization present on the channel” using the message

to differentiate a) voice bursts from data/control bursts and from reverse channel bursts, b) inbound channels from outbound channels, c) the type of modulation on the channel, e.g. a Motorola P25 Phase 1 FDMA from a Motorola P25 Phase 2 TDMA, and d) the type of wireless communications system, e.g. a Motorola P25 system from a Motorola Low Tier Digital system.

Id.

E. Obviousness based on ETSI Standard and Zak

Petitioner contends that the combination of the ETSI Standard and Zak would have rendered claims 7 and 8 obvious. Pet. 30–39.

1. Analysis

Petitioner contends that the ETSI Standard teaches a TDMA system and, in combination with Zak, teaches limitation 7[a], for

knowing a first set of synchronization patterns associated with a desired timeslot and a second set of synchronization patterns associated with each of the other timeslots in the TDMA system, wherein the first set of synchronization patterns is mutually exclusive from the second set of synchronization patterns, and each set comprising at least two different synchronization patterns as a function of at least one of a payload type and a source of the transmission.

Ex. 1001, 17:38–46; Pet. 31–34; Ex. 1006, 18–19.

Petitioner maps Zak and the ETSI Standard to the limitations 7[b] – 7[e], providing arguments for the combination of references as understood by ordinarily skilled artisans. Pet. 34–39. For the determining step (limitation 7[c]), Petitioner argues that the ETSI standard TDMA timeslot

assignment “necessarily” teaches determining whether a timeslot is a current desired time slot. Pet. 36. In the alternative, Petitioner argues that

it would have been obvious to modify the ETSI Standard to “determin[e] whether the timeslot is a current desired timeslot for the TDMA system” in view of *Zak* because *Zak* discloses that “a user terminal which desires to communicate over the network will seek to acquire access to one of these channels by [1] tuning to the appropriate frequency, [2] identifying a channel which currently is not in use, and [3] acquiring timing synchronization with that channel.” Ex.1004 ¶ 96. In *Zak*, “identifying a channel which currently is not in use” comprises “determining whether the timeslot is a current desired timeslot for the TDMA system.” *Id.* It would further have been obvious to a POSITA to “determin[e] whether the timeslot is a current desired timeslot for the TDMA system” by performing “identifying a channel which currently is not in use” to avoid transmission on a channel that is in use and potentially disrupting communications using that channel. *Id.*

Pet. 36–37. Thus, Petitioner posits that determining is met by identifying a channel (timeslot) not in use and determining whether the timeslot is a current desired timeslot (assigned timeslot). *Id.*

For the selecting step (limitation 7[d]), Petitioner argues that “*Zak* teaches that if the assigned timeslot is not available, the device can be set to instead transmit in an *alternate* timeslot.” *Id.* at 38 (emphasis added).

Based on *Zak* teaching transmission on a timeslot or channel not in use, Petitioner asserts that a person of ordinary skill would have been motivated to combine ETSI and *Zak* to allow selection of the alternate synch patterns. *Id.* Finally, having selected the alternate synch pattern, Petitioner cites ETSI

standard for transmitting using the selected synchronization on the channel (timeslot) as recited in limitation 7[e]. *Id.* at 38–39.

Patent Owner argues that Petitioner’s evidence and argument fails to show that either the ETSI Standard alone or in combination with Zak teaches transmitting in the timeslot that is *not* the current desired timeslot as the limitations 7[c] to 7[e] require. PO Resp. 19–20; Ex. 1004 ¶ 98; PO Sur-Reply 7–8. Patent Owner argues that Petitioner implicitly acknowledged this requirement when describing Zak as teaching that if the assigned timeslot is not available, the device can be set to instead transmit in an *alternate* timeslot. PO Sur-Reply 7 (citing Pet. 27); *see* Pet. 27–28 (citing Ex. 1007, 6:12–17 (“Thus a user terminal which desires to communicate over the network will seek to acquire access to one of these channels by tuning to the appropriate frequency, identifying a channel which currently is not in use, and acquiring timing synchronization with that channel.”)); Ex.1004 ¶ 98).

We agree with Patent Owner that the *ordered* steps 7[c] to 7[e] require transmitting on an alternate timeslot, that is, a timeslot that is not an assigned timeslot. PO Resp. 7–9. The plain language of claim 7 states that the preparing step of limitation 7[b] is for “a timeslot,” indicating that it is broader than the assigned timeslot of the TDMA system. In limitation 7[c], the claim expressly requires a determination of whether the timeslot in the preparing step is the “current desired timeslot” (assigned timeslot) and selecting (limitation 7[d]) the appropriate synch pattern. The “selecting” step of claim 7[d] requires: “if the timeslot is the current desired timeslot, select[] a synchronization pattern selected from the first set of

synchronization patterns . . . otherwise select[] a synchronization pattern selected from the second set of synchronization patterns” The synchronization pattern that is selected in limitation 7[d] is then used during transmission in limitation 7[e]. Thus, although the claims and specification do not explicitly refer to an alternate timeslot, the claim requires transmitting on the timeslot that is not the current desired timeslot (assigned timeslot). *See* PO Resp. 19–20; Ex. 2008 ¶ 89.

Although Petitioner initially argued that Zak teaches transmitting on an alternate timeslot (Pet. 27, 38–39; Ex. 1004 ¶ 98), Petitioner’s Reply rejects this argument, and asserts that nothing in claim 7 requires transmitting on an alternate timeslot. Reply 18–19. Petitioner’s apparent reversal on the teachings of Zak undermines Petitioner’s arguments.

Regardless of Petitioner’s position, we are not persuaded by Petitioner’s arguments regarding Zak. Petitioner has not persuasively shown that Zak’s process of identifying a channel (timeslot) not in use and determining whether the timeslot is a current desired timeslot (assigned timeslot) teaches the determining and selecting steps recited in claim 7. *See* Pet. 36–38; Ex. 1004 ¶ 96. While Zak refers to channels not in use, it does not refer to transmitting on these unused (unassigned) channels or any other channels apart from the assigned timeslot. PO Resp. 21–22 (citing Ex. 1007, 1:27–30; Ex. 2008 ¶ 93).

Petitioner does not demonstrate persuasively how the determination and selection in the combination of the ETSI Standard and Zak teaches determining, selecting, and transmitting on a non-assigned timeslot, which is required in claim limitations 7[c] to 7[e]. PO Resp. 20–21; PO Sur-Reply 8–

9. Petitioner’s reply argument that there is only one timeslot acted upon and used throughout claim 7 (Reply 18–19), fails to address the case where the timeslot of limitation 7[b] is *not* the “current desired timeslot” of limitation 7[c], that is, when that unassigned timeslot is used in transmission in limitations 7[c] to 7[e]. Indeed, Petitioner’s argument limits claim 7 to transmitting on the assigned timeslot and reads transmitting using the second set of synchronization patterns that correspond to the unassigned timeslot (limitation 7[d]) out of the claim. Reply 18–19; PO Sur-Reply 8–9. Indeed, the ’991 patent expressly discusses allowing transmissions on the current desired timeslot and alternate timeslots. *See* PO Resp. 5–6; Ex. 1001, 2:10–17; Ex. 2008 ¶¶ 50–51; Ex. 1001, Fig. 5, 9:33–10:15. Thus, the ’991 patent supports that claim 7 requires transmitting on an unassigned or alternate timeslot. Petitioner’s evidence and argument do not persuasively show how the ETSI Standard and Zak teaching regarding timeslots not in use discloses the determining, selecting, and transmitting limitations of claim 7.

We are also not persuaded by Petitioner’s reply argument that the ETSI Standard teaches the “determining” step because synchronization requires an assigned timeslot. Reply 16. The ETSI Standard’s timeslot assignment being required for synchronization does not support transmission on an alternate (unassigned) timeslot as required in claim 7. *Id.* Petitioner’s argument further reinforces that the combination of the ETSI Standard and Zak teaches transmitting only on an assigned timeslot (the current desired

timeslot of claim 7). *See id.* We do not agree with Petitioner’s argument that the ETSI Standard implicitly teaches the determining step of claim 7.

Finally, we agree with Patent Owner’s argument and evidence that the ETSI Standard fails to teach using and transmitting the synchronization pattern that was selected when the timeslot is not the current desired timeslot. PO Resp. 20–21; PO Sur-Reply 8–9. Petitioner’s citations to the ETSI Standard are unavailing as the ETSI Standard discloses transmitting only on the assigned timeslot. Pet. 38–39; Reply 16. Zak also only discloses transmitting on an assigned timeslot. Ex. 1007, 1:27–30 (stating that users “transmit[] only during their assigned timeslots”); PO Resp. 20–21. Petitioner has not persuasively shown how the teachings of Zak and the ETSI Standard yield selecting sync patterns for the non-assigned channel and transmitting on the non-assigned channel. Petitioner has failed to show that the ETSI Standard and Zak teach or suggest transmitting in a timeslot that is not the current desired timeslot of claim 7 or dependent claim 8. PO Resp. 20–21; PO Sur-Reply 8–9.⁸

Based on the foregoing, Petitioner has failed to demonstrate that the ETSI Standard and Zak teach or disclose the “determining,” “selecting,” and “transmitting” steps of claims 7 and 8.

2. Objective Indicia of Nonobviousness

We have also considered Patent Owner’s arguments regarding objective indicia of nonobviousness. *See* PO Resp. 57–66. Those

⁸ Because our findings with respect to Zak and the ETSI Standard are dispositive, we do not address (1) Patent Owner’s argument that Petitioner fails to show that the ETSI Standard in view of Zak teaches or discloses the

arguments are directed to products produced by Petitioner, rather than by Patent Owner, products that were found in an Initial Determination (“ID”) of the International Trade Commission (“ITC”) to infringe challenged claims 7 and 8 of the ’991 patent. Ex. 2009, 192–202. In addition, the Administrative Law Judge in that ID found that Petitioner intentionally copied Patent Owner’s patented technology. *Id.* at 226–228. That finding was based, in part, upon an adverse inference drawn from the repeated invocation of the Fifth Amendment when former employees of Patent Owner were questioned about allegations that they downloaded confidential documents of Patent Owner shortly before becoming employed by Petitioner. *Id.* at 241–242 (citing *LiButti v. United States*, 107 F.3d 110, 123–24 (2d Cir. 1997)). In addition to Patent Owner’s detailed discussion of how Petitioner’s products embody all limitations of the challenged claims, these specific administrative findings support Patent Owner’s position that there is sufficient nexus between its evidence and the challenged claims. PO Resp. 57–62; *Institut Pasteur & Universite Pierre et Marie Curie v. Focarino*, 738 F.3d 1337, 1347 (Fed. Cir. 2013).

“knowing” or “selecting” the required synchronization patterns or the “preparing” limitations of claim 7 (PO Resp. 22–24, 31–34); and (2) Patent Owner’s assertion that Petitioner has provided insufficient evidence to support how a person of ordinary skill could modify the ETSI Standard with Zak, or demonstrate a motivation to combine the ETSI Standard with Zak (PO Resp. 27–31). Finally, we also do not reach Patent Owner’s argument that Petitioner’s Reply and supplemental declarations improperly present new arguments not raised in the Petition. PO Sur-Reply 21–24; *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016); 35 U.S.C. § 312(a)(3).

Patent Owner's evidence includes not only the copying noted above, but also various marketing efforts by Petitioner, sufficient for the ITC judge to find that Petitioner "actively encourages, directs, intends, and teaches third parties to infringe the claims of the '991 Patent, including by providing training materials on how to configure Pseudo Trunk and TDMA Direct Mode." PO Resp. 62–64; Ex. 2009, 255. Of particular note among Petitioner's materials is a document that identifies the availability of a second channel as a "major reason" for a particular customer purchase of a Hytera system (Petitioner's system):

After testing DMR radios from a couple of manufacturers, the firefighters decided upon a Hytera system – and *a major reason* for this choice was the doubling of capacity made possible by Hytera's support for 'pseudo-trunking' or 'dual-slot trunking.' "If one slot is occupied, then the radio will use the next one," he explains. "It's not a very great solution because it only gives you one more timeslot – but in reality that makes a world of difference to the client."

Ex. 2017, 8 (emphasis added); *see* PO Resp. 62–64. Petitioner questions the value of such evidence, noting that Patent Owner relies on the ITC decision as a proxy instead of proffering the kind of evidence, such as market share information or industry praise, that Petitioner asserts is necessary to establish commercial success. Reply 26. Petitioner's limited reply fails to address evidence of copying or the specific features and functions of Petitioner's commercial products found to embody all the limitations of the challenged claims. *Id.* Although we agree with Petitioner that the type of evidence mitigates the weight to be accorded Patent Owner's evidence, we find that

that evidence nonetheless modestly supports a conclusion that the claims would not have been obvious in view of the asserted prior art.

3. Conclusion

Based on the forgoing, we determine that Petitioner has not demonstrated by a preponderance of the evidence that of claims 7 and 8 of the '991 patent are unpatentable under 35 U.S.C. § 103(a) over the ETSI Standard and Zak.

F. Obviousness based on Yamaguchi, ETSI Standard and Zak

Petitioner contends that Yamaguchi, in view of the ETSI Standard and Zak, would have rendered claims 7 and 8 obvious. Pet. 18–30. Petitioner's analyses for the determining, selecting, and transmitting steps of claims 7 rely on the same arguments and evidence presented with respect to the ETSI Standard and Zak. *Compare id.* at 25–29 *with id.* at 36–39. Petitioner's analysis, as discussed above, relies on the ETSI Standard in combination with Zak for the selecting step of claim 7. Pet. 26–29. For this ground, Petitioner cites the same teachings of Zak discussed in the ETSI Standard and Zak ground to modify Yamaguchi and the ETSI Standard to teach the “otherwise selecting a synchronization pattern” claim 7[d] limitation. *Id.* at 27–28. For this combination, Petitioner states that:

In this combined system of Yamaguchi, in view of the ETSI Standard and Zak, the transmitting device (finding timeslot 1 busy for example, would then synchronize and transmit on timeslot 2) and would use the appropriate set of synchronization patterns from the alternate timeslot. Ex. 1004 ¶ 82. A POSITA would be motivated *to modify the system in view of Zak to allow transmission on alternate timeslots* so that more frequency channel bandwidth could be utilized, and delay or denial of

transmissions due to the timeslot being in use would be reduced.
Id.

Pet. 28 (emphasis added). We note that although Petitioner's reply argument denies that claim 7 requires transmitting on an alternate timeslot (Reply 18–19), the Petition expressly describes modifying Yamaguchi and ETSI to teach transmitting on alternate timeslots to meet the limitations of claim 7. Pet. 28. Thus, Petitioner argues that Zak teaches transmitting on available non-assigned channels and this teaches transmission on an alternate channel. Pet. 28–29, 37–39.

For the same reasons discussed above with respect to the ETSI Standard and Zak ground, we are not persuaded by Petitioner's argument based on Yamaguchi, the ETSI Standard, and Zak teaching transmitting on an unassigned timeslot. *See* Sec. E.1, above. Petitioner's arguments for dependent claim 8 do not cure the deficiencies noted above with respect to claim 7. Pet. 29–30. Accordingly, we determine that Petitioner has not demonstrated by a preponderance of the evidence that claims 7 and 8 of the '991 patent are unpatentable under 35 U.S.C. § 103(a) over the combination of Yamaguchi, , the ETSI Standard, and Zak.

G. Obviousness based on Yamaguchi, Wiatrowski, and Zak

Petitioner contends that Yamaguchi, in view of Wiatrowski (which replaces the ETSI Standard), and Zak render claims 7 and 8 obvious. Pet. 39–48. Petitioner's analysis for the determining, selecting, and transmitting steps of claim 7 rely on the same arguments and evidence presented with respect to the ETSI Standard and Zak. *Compare id.* at 44–47 *with id.* at 36–39. Petitioner further admits that this ground is identical in analysis to the

Yamaguchi, ETSI Standard, and Zak ground. *Id.* at 39–40. Accordingly, for the reasons discussed above, we determine that Petitioner has not demonstrated by a preponderance of the evidence that claims 7 and 8 of the ’991 patent are unpatentable under 35 U.S.C. § 103(a) over the combination of Yamaguchi, Wiatrowski, and Zak.

III. MOTION TO EXCLUDE

Petitioner filed a Motion that moves to exclude Exhibits 2009, 2010, 2012–2019, and 2021 in Patent Owner’s evidence as well as Exhibit 2020. Paper 40. We deny Petitioner’s Motion for the reasons below.

Petitioner moves to exclude evidence related to Patent Owner’s arguments regarding objective indicia of nonobviousness, namely Exhibits 2009, 2010, 2012–2019, and 2021. *Id.* at 2–3. With respect to this evidence, the ITC’s ID, filed as Exhibit 2009, relates, *inter alia*, to certain claims of the ’991 patent challenged in this proceeding. *See* Ex. 2009, 2–3. Petitioner contends that the exhibit should be excluded under Fed. R. Evid. 401, 402, and 403 “because it is irrelevant, prejudicial, confusing, and misleading.” Paper 40, 2. Because the ID is “initial,” Petitioner contends that it “is not binding on the PTAB and the Commission was free to disagree with or modify the ID.” *Id.* Petitioner further notes that the Commission subsequently issued a Notice affirming-in-part, modifying-in-part, reversing-in-part, and striking certain portions of the ID. *Id.* at 3. In addition, Petitioner notes that “[t]he Commission’s decision is further subject to approval by the President of the United States and is appealable.” *Id.* On these bases, Petitioner contends that “any probative value of the ID is outweighed by potential prejudice, confusion, and potential to mislead,” and

that the ID is “misleading and confusing and should be excluded as unduly prejudicial.” *Id.* at 3.

We are not persuaded by this argument. Petitioner’s arguments go to the weight that should be accorded to the ID, not to its admissibility. *See Liquid Dynamics Corp. v. Vaughan Co.*, 449 F.3d 1209, 1221 (Fed. Cir. 2006) (“Vaughan’s challenge goes to the weight of the evidence rather than the admissibility of Lueptow’s testimony and analysis.”). As Patent Owner responds, the ITC “determined *not* to review the portions of the ID’s findings regarding the ’991 patent.” Paper 43, 4. And we agree with Patent Owner that Petitioner’s argument that the Final Determination is subject to approval by the President lacks merit because the President did not act on the Final Determination within the period specified by 19 U.S.C. § 1337(j)(2). *Id.* at 4–5.

The ID recounts evidence that has been considered and evaluated by an objective and disinterested judge, and articulates findings that are relevant to whether there is a sufficient nexus between the challenged claims and Patent Owner’s evidence regarding Petitioner’s products. The ID is also relevant to the issue of copying by Petitioner. Although Petitioner asserts that the ID is prejudicial or confusing, it provides insufficient argument to support those assertions.

With respect to Exhibits 2010, 2012–2019, and 2021, Petitioner contends that these exhibits are Hytera advertising and marketing documents, which do not supply sales numbers or third-party praise to prove commercial success. Paper 40, 3–4. Again, this argument relates to the weight to be accorded to that evidence, not to its admissibility. As we note

above, we agree with Petitioner that these factors impact the appropriate weight to be accorded to the evidence, and we have accounted for that impact.

Finally, we deny Petitioner's request that Exhibit 2020 should be excluded under Fed. R. Evid. 401 and 402 because Patent Owner's demonstrative slides in Exhibit 2020 rely on Exhibits 2010, 2012–2019, and 2021. As the Board reminded the parties in its Order granting oral argument, “[d]emonstrative exhibits are not evidence.” Paper 44, 3. Exhibit 2020 is merely a demonstrative and is not evidence.

IV. ORDER

Accordingly, it is:

ORDERED that, based on a preponderance of the evidence, claims 7 and 8 of U.S. Patent No. 8,279,991 B2 have not been shown to be unpatentable;

FURTHER ORDERED that Petitioner's Motion to Exclude (Paper 40) is *denied*; and

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

IPR2017-02183
Patent 8,279,991 B2

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