

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICROCHIP TECHNOLOGY INC.,
Petitioner,

v.

APTIV TECHNOLOGIES AG,
Patent Owner.

IPR2024-00230
Patent 11,176,072 B2

Before JEAN R. HOMERE, TERRENCE W. McMILLIN, and
JOHN D. HAMANN, *Administrative Patent Judges*.

HAMANN, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision

Determining All Challenged Claims Unpatentable

35 U.S.C. § 318(a)

Denying Patent Owner's Motion to Strike

37 C.F.R. § 23(b)

Denying Petitioner's Motion to Exclude

37 C.F.R. § 42.64(c)

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I. INTRODUCTION

In this *inter partes* review, instituted pursuant to 35 U.S.C. § 314 (2018), Microchip Technology Inc. (“Petitioner”) challenges the patentability of claim 1 (“the challenged claim”) of U.S. Patent No. 11,176,072 B2 (Ex. 1009, “the ’072 patent”), owned by Aptiv Technologies AG (“Patent Owner”).¹ 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 (2024). For the reasons discussed herein, we determine that Petitioner shows by a preponderance of the evidence that the challenged claim is unpatentable.

A. Procedural History

Petitioner filed a Petition requesting *inter partes* review of claim 1. Paper 1 (“Pet.”). Patent Owner filed a Preliminary Response. Paper 9. With authorization, Petitioner filed a Preliminary Reply (Paper 10) to address unanticipated issues raised by Patent Owner, and Patent Owner filed a Preliminary Sur-reply (Paper 11) in response. We instituted *inter partes* review of claim 1 on the grounds raised in the Petition. Paper 12 (“Dec. on Inst.”), 41.

Following institution, Patent Owner filed a Response to the Petition. Paper 25 (“PO Resp.”). Petitioner filed a Reply to Patent Owner’s Response. Paper 30 (“Pet. Reply”). Patent Owner filed a Sur-reply to Petitioner’s Reply. Paper 40 (“PO Sur-reply”).

¹ “Patent Owner” also refers to and includes Unwired Technology LLC (“Unwired”) and Delphi Automotive Systems (“Delphi”). According to Patent Owner, Delphi acquired Unwired in 2014, and Delphi later changed its name to Aptiv Technologies AG. PO Resp. 58 n.2.

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An oral hearing was held on April 16, 2025. A transcript of the oral hearing is included in the record. Paper 53.

B. Real Parties-In-Interest

Petitioner states that it and “its subsidiaries are the real parties-in-interest.” Pet. 83. Patent Owner identifies itself and Aptiv Services US, LLC as real parties-in-interest. Paper 4, 2.

C. Related Matters

The parties identify *Aptiv Techs. AG v. Microchip Tech. Inc.*, Case No. 1:23- cv-00307-JDW (D. Del.), as a matter that may affect, or be affected by, a decision in this proceeding. Pet. 83; Paper 4, 2.

The parties also collectively identify the following review challenges to related patents: (i) US Patent No. 9,619,420 B2 (“the ’420 patent”) (IPR2024-00228); (ii) US Patent No. 9,645,962 B2 (IPR2024-00229); (iii) US Patent No. 11,681,643 B2 (PGR2024-00011); (iv) US Patent No. 9,460,037 B2 (IPR2024-00494); (v) the ’420 patent (IPR2024-00495); and (vi) US Patent No. 10,545,899 B2 (IPR2024-00496). Pet. 83–84; Paper 7, 2–3.

D. The Challenged Patent

The ’072 patent “generally relates to Universal Serial Bus (‘USB’) connectivity between . . . mobile consumer devices and vehicle electronic systems.” Ex. 1009, 1:21–23. “Historically, mobile consumer devices[,] such as . . . smart phones, . . . have relied on connections to other devices, such as laptop or desktop personal computers . . . to acquire content, exchange data, and charge the device’s internal battery,” according to the ’072 patent. *Id.* at 1:29–33. “For many years . . . , that has been accomplished through USB ports on each device.” *Id.* at 1:33–35. “USB

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protocols require a point-to-point connection in which one end is the USB Host or master, and the other end is a USB Device or slave,” so that “the flow of messages between the two devices is managed and controlled, whereby the USB Device responds to messages initiated by the USB Host.” *Id.* at 1:37–42.

“In vehicle systems that employ USB connections, . . . the vehicle is typically the USB Host,” and “[t]he USB Host function is often embedded into a component of the vehicle infotainment system, such as into the radio or other control module,” according to the ’072 patent. *Id.* at 1:49–53. “Typically, multiple USB ports are strategically designed into the vehicle in locations convenient for the driver and passengers to connect their consumer devices.” *Id.* at 1:54–56. The ’072 patent explains that because “there can be many USB ports in a vehicle, and each port requires a cable to connect the port to the USB Host, it is desirable to share cabling,” which “is accomplished through the use of USB Hubs.” *Id.* at 1:66–2:4. In particular, “USB Hubs allow a single USB Host to connect to multiple USB Devices over a single cable between the USB Host and the USB Hub.” *Id.* at 2:4–6. “Once a consumer device is connected to one of the ports, the device begins charging and the vehicle infotainment system can access content on the consumer device.” *Id.* at 1:56–59.

In addition, the ’072 patent explains that “leading mobile device manufacturers and system designers have begun designing their mobile device products (i.e., smart phones, tablets, etc.) to support both USB Host and USB Device roles.” *Id.* at 2:59–62. “In other words, the phone may configure itself such that it can function as a USB Device when it needs to be, or as a USB Host when it needs to be.” *Id.* at 2:62–65. In fact, the ’072

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patent predicts that increasingly “the smart phone will act primarily as the USB Host, and will rarely or never act as a USB device,” which “presents some problems for automotive systems” which “have a USB Host and require USB Devices to connect to it.” *Id.* at 3:2–8. In particular, “[i]f a phone acts as a USB Host, then the system will not function since by USB convention, two USB Hosts cannot directly connect with each other.” *Id.* at 3:9–12. “A redesign of the USB architecture in the vehicle is thus necessary such that the vehicle can act either as the USB Host (when necessary to connect to USB Devices such as memory sticks, thumb drives, etc.) or USB Device (when necessary to connect to USB Hosts, such as a smart phone which demands to be USB Host rather than USB Device[]),” according to the ’072 patent. *Id.* at 3:13–19.

The ’072 patent explains that “[t]he USB organization has added a standard that addresses the need for devices to act as either USB Host or USB Device and as such can be considered a ‘dual role’ USB controller.” *Id.* at 3:21–25. “It is referred to . . . as ‘On the Go’ or ‘OTG’ for short,” and “[a]ny device that meets the OTG standard can act as either USB Host or USB Device and can change roles dynamically.” *Id.* at 3:25–27. The ’072 patent also acknowledges that custom USB hubs can be implemented “wherein the USB Hub is able to dynamically swap its upstream port with one of its downstream ports when commanded to do so.” *Id.* at 3:49–52.

The ’072 patent, however, identifies disadvantages associated with these approaches. *Id.* at 3:39–48, 3:59–4:3. In response, the ’072 patent “provide[s] a system which is configured to enable a vehicle’s embedded USB Host system to connect to mobile devices through a USB Hub, regardless of whether the mobile devices are configured to act as USB Hosts

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or USB Devices, without the need to provide OTG or dual role controllers in the head unit [(i.e., a central vehicle microcontroller in the vehicle system architecture)] and without the need to provide additional cabling in the vehicle.” *Id.* at 4:7–15; *see also id.* at 2:22–24, Fig. 3 (illustrating head unit). Figure 4, shown below, illustrates an embodiment of the ’072 patent.

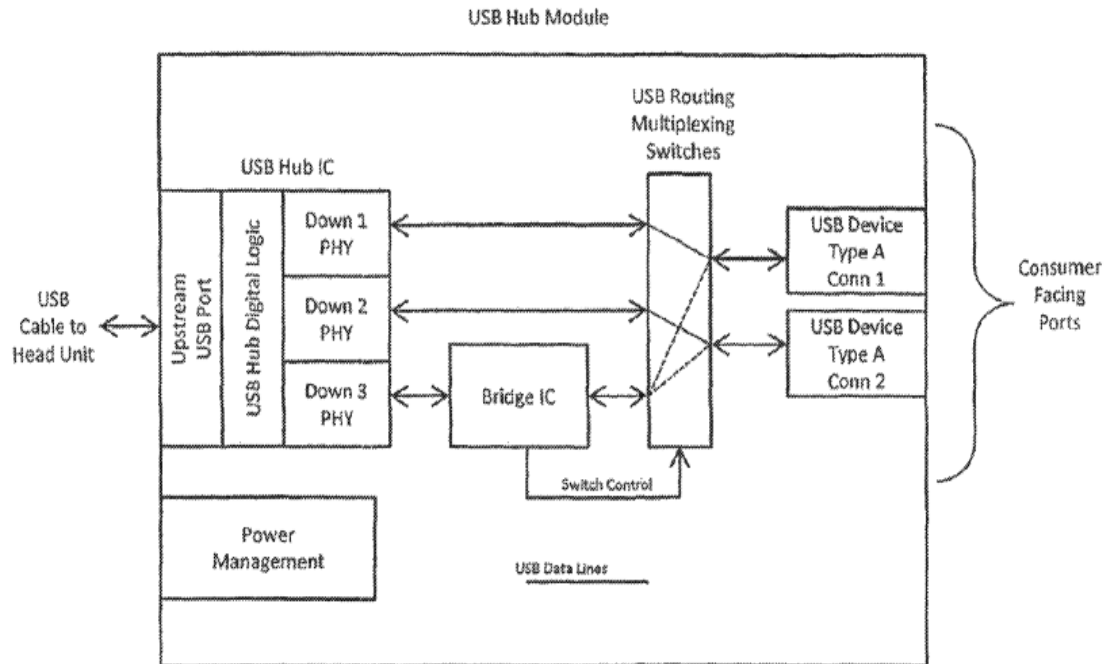


Figure 4 “illustrates a system which is in accordance with an embodiment of the [’072 patent], wherein a USB Hub, USB Bridge and a switching device are provided as discrete components.” *Id.* at 5:24–27. As illustrated, the system comprises a USB Hub Module having a USB Hub, a USB Bridge, and Multiplexing Switches, implemented as discrete devices. *Id.* at 5:53–56. The USB Hub comprises “an integrated circuit (IC), and is configured (via an upstream USB port) connected to a vehicle’s embedded USB Host (such as a USB Host in a Head Unit) via vehicle internal wiring.” *Id.* at 5:56–61. As illustrated, the USB Hub also includes three downstream USB ports, one of which is connected to the USB Bridge and two of which are connected to

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the Multiplexing Switches. *Id.* at 5:61–67. The switching device is shown as connected to two USB ports in the vehicle for connection to a consumer device. *Id.* at 5:67–6:2. The ’072 patent explains that “[t]he USB Bridge is configured to effectively control the switching device,” as indicated in the figure. *Id.* at 6:3–5, Fig. 4.

“The USB Hub Module is configured such that signals received from at least one [consumer facing] USB port are received by the switching device, and the switching device routes the signals to the USB Bridge or the USB Hub.” *Id.* at 6:5–8. In particular, “where the consumer device is acting as USB Host, the USB Bridge processes the USB packets from the consumer port and provides them to the USB Hub, thereby rendering the consumer device compatible with the vehicle’s embedded USB Host.” *Id.* at 6:8–13. On the other hand, “where the consumer device is acting as USB Device, the USB Bridge controls the switching device such that the switching device provides the USB signaling directly to the USB Hub, bypassing the Bridge.” *Id.* at 6:13–17.

In sum, the ’072 patent’s embodiments “effectively render a vehicle’s embedded USB Host compatible with consumer devices which are configured to also act as USB Host or USB Device.” *Id.* at 5:50–53.

E. The Challenged Claim

Petitioner challenges claim 1, which is reproduced below:

1. A method, comprising:
providing efficient communications among USB components of a data communication system that includes a first input port, a second input port, a USB hub, a USB bridge connected to the USB hub, an embedded USB host connected to the USB hub, a USB port connected to a USB device capable of operating in a USB Host mode and a USB device mode, and USB

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multiplexing switches connected to the USB port, the USB hub, and the USB bridge;

receiving a first USB signal from the USB device via the USB port while the USB device is operating in the USB host mode;

routing the first USB signal via the USB multiplexing switches from the USB device to the embedded USB host through the USB bridge and the USB hub;

receiving a second USB signal from the USB device via the USB port while the USB device is operating in the USB device mode; and

routing the second USB signal via the USB multiplexing switches from the USB device to the embedded USB host through the USB hub, wherein the second USB signal from the USB device to the embedded USB host bypasses the USB bridge.

Ex. 1009, 9:15–10:18.

F. Instituted Grounds of Unpatentability

We instituted trial based on the following grounds of unpatentability, which are all the grounds of unpatentability raised in the Petition:

Claim(s) Challenged	35 U.S.C. § ²	Reference(s)/Basis ³
1	103	Chang, ⁴ Chang II ⁵
1	103	Chang, Chang II, Chutorash ⁶

² The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the ’072 patent issued from an application having an effective filing date after March 16, 2013, we apply the AIA version of the statutory basis for unpatentability.

³ Petitioner also lists for each asserted ground the knowledge of one of ordinary skill in the art. Pet. 5. Such listing is unnecessary as we already consider such knowledge as part of our obviousness analysis. *See Randall Mfg. v. Rea*, 733 F.3d 1355, 1362–63 (Fed. Cir. 2013).

⁴ US 2006/0206650 A1, published Sept. 14, 2006 (Ex. 1014, “Chang”).

⁵ US 2009/0268743 A1, published Oct. 29, 2009 (Ex. 1015, “Chang II”).

⁶ US 8,447,598 B2, issued May 21, 2013 (Ex. 1029, “Chutorash”).

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Pet. 5, 42–76. Petitioner submits in support of its arguments the Declaration of Eric Welch (Ex. 1013), the Declaration of Jeffrey L. Ravencraft (Ex. 1024), the Reply Declaration of Eric Welch (Ex. 1102), and the Declaration of John Phillips (Ex. 1104). Patent Owner submits in support of its arguments the Declaration of Henry Houh (Ex. 2001), the Supplemental Declaration of Henry Houh (Ex. 2019), and the Declaration of Michael Dreon (Ex. 2036).

II. LEVEL OF ORDINARY SKILL IN THE ART

To determine whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962–63 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

In our Decision on Institution, we adopted the definition Patent Owner proposes for one having ordinary skill in the art at the time of the invention of the ’072 patent. Dec. on Inst. 9–10. Namely, we found that one of ordinary skill in the art “would have had a bachelor’s degree in computer science, electrical engineering, or an equivalent, and two years of professional experience working with computer network protocols such as USB,” and that “[l]ack of work experience can be remedied by additional education, and vice versa.” *Id.*; see also PO Resp. 3 (citing Ex. 2019 ¶ 26)

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(providing again this definition for one of ordinary skill). Because Patent Owner’s definition of the level of skill in the art is consistent with the ’072 patent and the asserted prior art, we maintain it for purposes of this Final Written Decision. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC*, 57 F.3d at 1579; *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

Moreover, we credit Dr. Houh’s testimony articulating this definition, as it is based on his “industry experience hiring and managing technical personnel in the computer networking field, and [his] understanding of the basic qualifications that would be relevant to an individual tasked with investigating methods and systems in the relevant area, and [his] familiarity with the backgrounds of colleagues, both past and present.” Ex. 2019 ¶ 29 (providing basis for proffered definition); Ex. 2001, Appx A; PO Resp. 3.

Petitioner’s proposed definition, which we do not adopt, articulates required education and work experience, and enumerates certain knowledge that one of ordinary skill would have had. Pet. 26–27. As to education, Petitioner argues that one of ordinary skill in the art “would have had at least a four-year degree in electrical engineering, computer engineering, computer science, or a related field,” and that “relevant work experience may substitute for formal education.” *Id.* (citing Ex. 1013 ¶ 47). As Petitioner acknowledges, there is no substantive difference between the parties’ definitions as to education for our purposes here. *Compare* Pet. 26–27, *with* PO Resp. 3; Pet. Reply 2.

As to work experience, Patent Owner requires “two years of professional experience working with computer network protocols such as USB,” and provides that “[l]ack of work experience can be remedied by

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additional education.” PO Resp. 3. Petitioner requires “substantial experience (*e.g.*, several years) designing USB systems, including USB hosts, USB hubs, and USB devices,” and provides that “[a] relevant advanced degree may substitute for some work experience.” Pet. 26–27 (citing Ex. 1013 ¶ 47). The root of the difference between these is that Patent Owner argues that the required work experience is with “computer network protocols,” of which USB is merely an example, while Petitioner argues that the work experience must be with the USB protocol.

We agree with Patent Owner and find that “computer network protocols” is correct in light of the ’072 patent’s disclosure and claim 1. In particular, the ’072 patent teaches that it “generally relates to [USB] connectivity between, for example, mobile consumer devices and vehicle electronic systems.” Ex. 1009, 1:21–23. And the ’072 patent’s teachings focus on common network components (*e.g.*, hub, bridge, ports) and common networking concepts (*e.g.*, master/slave network architecture and bridging) which are used in the USB context, rather than detailed aspects (*e.g.*, signal timing, signal levels, power levels) of the USB protocol. *See* generally Ex. 1009; *see also* Ex. 1084, 103:21–104:2, 104:24–105:4; Pet. Reply 4 (citing Ex. 1084,⁷ 100:17–101:12 (acknowledging that Dr. Houh testifies that one of ordinary skill in the art “would know basic USB concepts like bridging, master/slave architecture, etc.”), 102:3–8, 103:21–104:2, 104:24–105:4). Likewise, claim 1 repeatedly recites “USB,” but does so to identify that all of the components of the data system (*i.e.*, USB ports, USB hub, USB bridge, USB host, USB multiplexing switches) employ the USB protocol. Ex. 1009, 9:15–10:18. As the ’072 patent teaches, “USB

⁷ Houh Deposition Tr. (2024/12/18, Day 1).

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technology . . . [wa]s commonly available, familiar to the end user, cost effective and ubiquitous.” *Id.* at 1:35–37. Thus, although the ’072 patent is taught in the USB context, “computer network protocols” concepts are the focus. For these same reasons, we find unavailing Petitioner’s argument that one of ordinary skill in the art “would have been well-versed in USB standards (including the USB 2.0 and 3.0 Specifications and the OTG Supplement) and the design/deployment of USB hosts, USB devices, and USB hubs, including suitable environments for USB systems.” Pet. 26.

In addition, we find unwarranted including in the skill level definition that one of ordinary skill in the art “would also have had a working understanding of network/communication architectures (*e.g.*, master/slave) and components (*e.g.*, host-to-host bridges), computer hardware and peripherals, computer programming, and the design/implementation of communication software/firmware/drivers in standard operating systems (*e.g.*, Windows and Linux) and embedded systems,” as Petitioner argues. *Id.* (citing Ex. 1013 ¶¶ 45–49). Most, if not all, of these items already are included within Patent Owner’s definition in light of the required education and work experience with “computer network protocols.” Petitioner does not explain why having such granularity in the level definition is warranted. *See* Pet. Reply 3 (acknowledging that “[t]o the extent [Patent Owner]’s more generic statement encompasses the same substantive knowledge base, little difference exists between the parties’ definitions and the prior art analysis is substantially the same”).

Lastly, we give little weight to Mr. Welch’s testimony regarding the level of one of ordinary skill as he does not indicate what precisely constitutes the basis of his testimony on this issue. *See* Ex. 1013 ¶ 47.

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In sum, we adopt Patent Owner’s proposed definition for one of ordinary skill in the art for the reasons provided above.

III. CLAIM CONSTRUCTION

Because the Petition was filed after November 13, 2018, we apply the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b); 83 Fed. Reg. 51,340, 51,340–41, 51,343 (Oct. 11, 2018). In applying such standard, claim terms are generally given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Here, Petitioner argues that “embedded USB host” means “USB host physically embedded in a vehicle.” See Pet. 27–28. “Patent Owner does not contend that any claim construction is required.” PO Resp. 5. We agree with Patent Owner that we do not need to construe any term to resolve the disputes between the parties. See, e.g., *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (“[W]e need only construe terms ‘that are in controversy, and only to

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the extent necessary to resolve the controversy.”). And we afford the claim terms their plain and ordinary meaning.

IV. GENERAL PRINCIPLES OF LAW

“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 of persuasion never shifts to Patent Owner except in limited circumstances not present here. *See Dynamic Drinkware*, 800 F.3d at 1378 (discussing the burden of proof in *inter partes* review).

A claim is unpatentable under 35 U.S.C. § 103 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 ordinary skill in the art; and (4) objective evidence of non-obviousness, if present. *See Graham*, 383 U.S. at 17–18. When evaluating a claim for obviousness, we also must “determine 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)).

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V. OBJECTIVE INDICIA OF NONOBVIOUSNESS

Objective indicia of non-obviousness “play[s] an important role as a guard against the statutorily proscribed hindsight reasoning in the obviousness analysis.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1328–30 (Fed. Cir. 2016). It “may often be the most probative and cogent evidence in the record,” and “must be considered in every case.” *Id.* at 1328 (emphasis omitted). Objective indicia of nonobviousness may include long-felt but unsolved need, failure of others, unexpected results, commercial success, copying, licensing, industry praise, and expert skepticism. *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1379 (Fed. Cir. 2012).

Objective indicia are only relevant to the obviousness inquiry if there is a nexus between the claimed invention and the objective indicia of nonobviousness. *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017) (citing *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1312 (Fed. Cir. 2006)); *Volvo Penta of the Americas, LLC v. Brunswick Corp.*, 81 F.4th 1202, 1210 (Fed. Cir. 2023) (citing *In re GPAC*, 57 F.3d 1573, 1580 (Fed. Cir. 1995) (“For objective evidence of secondary considerations to be relevant, there must be a nexus between the merits of the claimed invention and the objective evidence.”)). “The patentee bears the burden of showing that a nexus exists.” *Volvo*, 81 F.4th at 1211 (quoting *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019)). “A showing of nexus can be made in two ways: (1) via a presumption of nexus, or (2) via a showing that the evidence is a direct result of the unique characteristics of the claimed invention.” *Id.* at 1210.

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A. Presumption of Nexus

“A patent owner is entitled to a presumption of nexus when it shows that the asserted objective evidence is tied to a specific product that ‘embodies the claimed features, and is coextensive with them.’” *Id.* (quoting *Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.*, 229 F.3d 1120, 1130 (Fed. Cir. 2000)). In other words, “[a] presumption of nexus requires both that the product embodies the invention and is coextensive with it.” *Id.* at 1211 (citing *Brown*, 229 F.3d at 1130). Patent Owner fails to show either of these requirements.

First, Patent Owner argues that in his Supplemental Declaration, Dr. Houh “provides on a per limitation basis how [Patent Owner]’s dual role hub meets all limitations of claim 1.” PO Resp. 73 (citing Ex. 2019 ¶ 136). Notably, Patent Owner cites to a single paragraph in this declaration, without providing any specific arguments in its Response that its product practices claim 1. *Id.* Rather, Patent Owner incorporates its arguments by reference, which is not permitted. See 37 C.F.R. § 42.6(a)(3) (“Arguments must not be incorporated by reference from one document into another document.”). Thus, we do not consider these arguments, and we are not persuaded that Patent Owner’s product practices claim 1. Consolidated Trial Practice Guide November 2019,⁸ 35–36 (citing *Cisco Systems, Inc. v. C-Cation Techs., LLC*, IPR2014-00454, Paper 12 (PTAB Aug. 29, 2014) (informative)) (“[P]arties that incorporate expert testimony by reference in their petitions . . . without providing explanation of such testimony risk having the testimony not considered by the Board.”).

⁸ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

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Second, even assuming that Patent Owner’s product practices claim 1—which has not been shown—Patent Owner does not provide any detailed analysis showing that its product is coextensive with claim 1 to support a presumption. *See Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential) (finding a presumption of nexus is inappropriate where a patent owner does not provide an analysis demonstrating that its products are coextensive with the challenged claims). Rather, Patent Owner argues that claim 1 is “tied to [Patent Owner’s] commercial ‘dual-role hub’ containing its Boston-2 chip,” and that “[t]he combination of a host-to-host USB bridge with USB multiplexing switches allowed the dual role hub to provide CarPlay^[9] support on each downstream port without the need for a second upstream connection with the head unit and without interrupting USB connectivity on the non-CarPlay downstream ports.” PO Resp. 72–73 (citing Ex. 2042,¹⁰ 201:19–202:13); PO Sur-reply 25–26. “It was therefore the specific arrangement claimed in the patent that provided a solution to the ‘vexing problem’ facing automakers and their suppliers and which ultimately drove demand for [Patent Owner]’s product,” according to Patent Owner. PO Resp. 73 (citing Ex. 2042, 202:14–22). These arguments do not even allege that Patent Owner’s dual role hub product does not also contain significant features that are unclaimed, which is a required showing. *See Fox Factory*, 944 F.3d at 1374 (citing *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir.

⁹ We agree with Petitioner that claim 1 says nothing about CarPlay. Ex. 1009, 9:15–10:18; *see, e.g.*, Pet. 77; Pet. Reply 25. We focus on the network components in Patent Owner’s arguments as they relate to claim 1.

¹⁰ *Microchip Tech. Inc. v. Aptiv Services US, LLC*, C. A. No. 17-1194 (D. Del.), Trial Transcript (Vol. 4) (Apr. 11, 2022).

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1988)) (“Although we do not require the patentee to prove perfect correspondence to meet the coextensiveness requirement, what we do require is that the patentee demonstrate that the product is essentially the claimed invention.”).

In sum, Patent Owner does not show that its product practices and is coextensive with claim 1. We, therefore, find that a presumption of nexus is not established.

B. Evidence is Direct Result of Unique Characteristics of Invention

We next look to whether Patent Owner demonstrates that the evidence of secondary considerations is the direct result of the unique characteristics of the claimed invention. In particular, we address below Patent Owner’s arguments directed to the secondary considerations of (i) long-felt but unsolved need, (ii) failure of others / expert skepticism, (iii) commercial success, (iv) industry praise, and (v) copying. PO Resp. 54–72; PO Sur-reply 24–26.

1. Long-Felt Need

Patent Owner argues that there was a long-felt need which the invention of the ’072 patent addresses. PO Resp. 54–59; PO Sur-reply 26. More specifically, Patent Owner argues that “Apple announced its broad release of the feature (later known as CarPlay) in early 2013.” PO Resp. 54 (citing Ex. 2019 ¶ 121; Ex. 2040,¹¹ 84:5–86:5). According to Patent Owner, its dual role hub product satisfied CarPlay’s requirements. *Id.* at 55–59. And Patent Owner asserts—insufficiently so as we discuss above—that its dual role hub product practices claim 1. *Id.* at 73.

¹¹ *Microchip Tech. Inc. v. Aptiv Services US, LLC*, C. A. No. 17-1194 (D. Del.), Trial Transcript (Vol. 2) (Apr. 7, 2022).

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Even if we assume that Patent Owner's arguments are correct, we find that Patent Owner does not show that there was a long-felt need that the claimed invention addresses. "[L]ong-felt need is analyzed as of the date of an articulated identified problem and evidence of efforts to solve that problem." *Texas Instruments Inc. v. U.S. Int'l Trade Comm'n*, 988 F.2d 1165, 1178 (Fed. Cir. 1993). Thus, we assume the need arose in early 2013, as Patent Owner argues. The '072 patent has an effective filing date of September 16, 2014. Ex. 1009, code (63). Accordingly, the need existed for less than two years, which we find is not long-felt under the circumstances here.

We also find unavailing Patent Owner's reference to Apple's earlier iPod Out feature. PO Resp. 54–55. Patent Owner does not tie this feature to its product or the claimed invention. *Id.*

In sum, we find that Patent Owner does not show that there was a long-felt need for the claimed invention.

2. Failure of Others / Expert Skepticism

Patent Owner argues that there was a failure of others and skepticism of skilled artisans concerning its claimed invention. PO Resp. 59–63. More specifically, Patent Owner argues that claim 1's specific arrangement of network components provides a unique characteristic (e.g., enabling persistent downstream USB connectivity on all ports). *Id.* at 73. In other words, the first and second ports maintain their connectivity with the embedded USB host when a USB device operating in USB host mode is connected to the USB port. Ex. 1009, 9:15–10:18. We agree with Patent Owner that claim 1's specific arrangement enables persistent downstream USB connectivity on these other ports. *Id.*

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In addition, Patent Owner argues that Petitioner “was not able to provide persistent downstream data connectivity for non-CarPlay ports.” *Id.* at 59–60 (citing Ex. 2040, 237:22–238:8). In fact, Petitioner repeatedly acknowledged this problem, according to Patent Owner. *Id.* at 60–63 (citing Ex. 2005,¹² 1–2; Ex. 2006,¹³ 2; Ex. 2007,¹⁴ 1; Ex. 2009,¹⁵ 1; Ex. 2010,¹⁶ 1). Moreover, Patent Owner argues that Petitioner “told customers that the problem was not solvable.” *Id.* at 60–61 (citing Ex. 2002,¹⁷ 312:4–9).

In addition, Patent Owner argues that “[a]utomakers, too, had struggled with this same problem and were surprised by [Patent Owner]’s success.” *Id.* at 63 (citing Ex. 2042, 202:14–203:14).

Petitioner argues that it would not have been difficult to develop a product that enables persistent downstream USB connectivity. Pet. Reply 28. Rather, Petitioner argues that its delay in doing so was attributable to Apple telling Petitioner “in 2013 [that Apple] wanted ‘a “direct path” to the head unit’ . . . — meaning Apple would not allow a bridge.” *Id.* (citing Ex. 1100, 1). In contrast, Apple told Patent Owner “that using a bridge was likely ‘fine,’” according to Petitioner. *Id.* (citing Ex. 2003,¹⁸ 114:23–115:2).

As to the emails Patent Owner cites, Petitioner argues that they “discuss product development issues” and show Petitioner’s “lack of clarity

¹² Mark Orlosky and Brigham Steele Email Chain (June 18, 2014).

¹³ Stefan Saenger, Chris Behal, and Ray Kamps Email Chain (Oct. 1, 2014).

¹⁴ David Sroka, Eric Kawamoto, and Sal Canu Email Chain (Nov. 26–Dec. 1, 2014).

¹⁵ David Sroka, Don Perkins, and Sal Canu Email Chain (Aug. 11, 2014).

¹⁶ Sal Canu Email (Dec. 2, 2014).

¹⁷ *Microchip Tech. Inc. v. Aptiv Services US, LLC*, C. A. No. 17-1194 (D. Del.), Trial Testimony of Mitch Obolsky (Apr. 7, 2022).

¹⁸ *Microchip Tech. Inc. v. Aptiv Services US, LLC*, C. A. No. 17-1194 (D. Del.), Trial Testimony of Robert Voto (Apr. 11, 2022).

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regarding CarPlay requirements vis-à-vis the USB standards.” *Id.* (citing PO Resp. 60–63). Moreover, “the cited emails simply say [Petitioner]’s existing FlexConnect solution did not support USB persistence, not that it would be difficult to architect a solution that would,” according to Petitioner. *Id.* (citing Exs. 2005–2010).

Patent Owner’s evidence is weak with regard to the relationship between the alleged failure and skepticism, and the claimed invention. Some of the cited emails suggest a failure by others and skepticism of the claimed invention. *See* Ex. 2005, 2 (“We need to emphasize that you cannot do Carplay AND own the other ports with one USB data lane.”); Ex. 2007, 1 (“When persistent USB is a requirement we definitely have run into a wall.”); Ex. 2010, 1 (“Short-term:” “We looked at developing a solution for 1 upstream lane, persistent USB data and we don’t have a solution. We wish we could provide a solution but we don’t have it.”). While other of these emails suggest that the concern related to what Apple CarPlay allowed, rather than the difficulty in enabling persistent downstream USB connectivity. *See* Ex. 2006, 2 (discussing whether CarPlay has broader allowances); Ex. 2009, 1 (“CarPlay requires a dedicated path . . . this solution allows other USB devices to access the host . . . this is NOT Compliant.”); Ex. 2010, 1 (“Long-term:” “We will consider a solution for 1 upstream lane with persistent USB data but do not have a commitment for that now.” “Certification of this system would help make the case to Upper Management to put this solution in the pipeline.”).

On the whole, we give some weight to Patent Owner’s arguments and evidence for this secondary consideration in our overall consideration of obviousness. It does appear that Patent Owner succeeded where Petitioner

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for at least some time failed, and there was some skepticism about Patent Owner's solution.

3. *Commercial Success*

For the commercial success indicia to support nonobviousness, Patent Owner needs “to show both commercial success and that a nexus exists between that success and the merits of the claimed invention.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1350 (Fed. Cir. 2012).

Patent Owner argues that in 2014 the Big 3 (i.e., GM, Chrysler, and Ford) switched from Petitioner to Patent Owner for upcoming model year products. PO Resp. 64 (citing Ex. 2040, 229:14–19 (“Q. And who won The Big 3 USB hub CarPlay business in 2014? A. Yeah, so – so we got to the middle of the year, and later in the year, as we learned more about [Patent Owner], we learned that we had lost all three of them to [Patent Owner].”). In addition, Patent Owner argues that the sales were made “because its innovative solution [(i.e., its dual-rule hub)] permitted it to satisfy the three automaker requirements: (1) single upstream connection, (2) CarPlay on all ports, and (3) persistent downstream connectivity on non-CarPlay ports.” PO Resp. 65 (citing Ex. 2033¹⁹; Ex. 2042, 201:19–202:22). Patent Owner argues that its “pitch to automakers for the dual[-]role hub focused on this functionality.” *Id.* (citing Ex. 2027,²⁰ 11; Ex. 2028,²¹ 3).

Petitioner argues that Patent Owner ignores other factors affecting sales such as the impact of Apple's certification of Patent Owner's dual-role

¹⁹ Davis Sroka, Mike Pennell, Mark Bohm, Eric Kawamoto Email Chain (Jan. 12, 2015).

²⁰ Presentation titled “Delphi Data Connectivity” (June 9, 2017).

²¹ Presentation titled “Delphi Data Connectivity” (Oct. 7, 2015).

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hub, lower pricing, and marketing. Pet. Reply 26–27 (citing Ex. 2040, 233:4–12). And significantly, Patent Owner “benefited from a head start due to early, insider access to Apple’s confidential CarPlay requirements through” Jaguar, according to Petitioner. *Id.* at 27 (citing Ex. 2003, 108:1–109:12 (“Jaguar was talking to Apple...start[ed] feeding us some of these requirements.”), 149:12–22 (CarPlay “not publicly known” and “Apple is pretty secret”), 157:6–15).

We find that Patent Owner shows commercial success, but Patent Owner’s evidence is weak as to the relationship between that success and the claimed invention. That the Big 3 switched in 2014 from Petitioner to Patent Owner, an inexperienced chip manufacturer, and to its dual role hub for upcoming model year products, supports a nexus. Ex. 2040, 229:14–19. But we also agree with Petitioner that we should not discount the impact of Apple’s certification of Patent Owner’s dual role hub product. Moreover, claim 1 is silent as to CarPlay, and the dual-role hub allowing for CarPlay on all ports is not required by claim 1. In fact, claim 1 does not even state that the first and second ports need to be dual-role ports. See Ex. 1009, 9:15–10:18.

Accordingly, we give little weight to Patent Owner’s arguments and evidence for this secondary consideration in our overall consideration of obviousness.

4. Industry Praise

Patent Owner argues that it “achieved significant acclaim within the automotive industry for its dual role hub.” PO Resp. 65. In particular, Patent Owner argues that “it was the winner of the 2016 PACE Award, an industry honor awarded by Automotive News.” *Id.* at 65–66 (citing

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Ex. 2036 ¶ 4). In addition, Patent Owner relies on testimony from Michael Dreon in arguing that Patent Owner’s “dual-role hub received the PACE award because of its ability to allow persistent downstream USB connectivity to non-CarPlay devices while CarPlay was active without requiring an alteration to the head unit hardware to permit a second upstream connection.” *Id.* at 66 (citing Ex. 2036 ¶ 9). In particular, Mr. Dreon states that this testimony is “[b]ased on my conversations with the judges, as well as from the judges’ citation and award video.” Ex. 2036 ¶ 9.

In addition, we agree with Petitioner and find that the Judge’s Citation for the award states that Patent Owner solved the CarPlay integration problem “at a lower cost, in a smaller package and with all functionality.” Ex. 2038, 1–2; Pet. Reply 27. Thus, Petitioner’s criticism of this purported evidence of industry praise has merit.

On the whole, the evidence of industry praise is entitled to little weight.

5. Copying

Patent Owner argues that Petitioner copied its product. PO Resp. 67–72. To that end, Patent Owner argues that Petitioner investigated Patent Owner’s product. *Id.* at 68 (citing Ex. 2040, 234:10–235:6). In addition, Patent Owner argues that Petitioner prepared a presentation for automakers that “contained diagrams showing that [Petitioner] understood the basic structure of [Patent Owner]’s product, including the host-to-host USB bridge and multiplexing switches that enabled persistent downstream USB connectivity.” *Id.*; *see also id.* at 69–70 (discussing presentation).

We find that these arguments are insufficient to show copying. That Petitioner “investigated” Patent Owner’s solution does not mean that

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Petitioner had “access to [a] patented product combined with substantial similarity to the patented product.” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010). And again, Patent Owner does not show that its product practices claim 1 and is a patented product. Nor does the presentation show sufficient access to Patent Owner’s dual-hub product. Rather, the presentation shows that Petitioner developed a similar solution, which could support that such a solution is obvious instead of copied.

In addition, we find unavailing Patent Owner’s argument that Petitioner “obtained one of [Patent Owner]’s chips from a competitor and analyzed it to understand its capabilities,” including that Petitioner had “decapped” Patent Owner’s chip. PO Resp. 70 (citing Ex. 2040, 186:22–188:12). This activity occurred in July 2016 after Petitioner “finished [its] device and [was] making it available [for customer testing].” Pet. Reply 28–29 (citing Ex. 2040, 125:9–126:16).

Patent Owner’s evidence of alleged copying by Petitioner is entitled to little or no weight because it is not well-supported.

VI. OBVIOUSNESS OVER CHANG AND CHANG II

Petitioner argues that the combination of Chang and Chang II renders claim 1 obvious. Pet. 42–72. For the reasons that follow, we determine that Petitioner shows by a preponderance of the evidence that the combination of Chang and Chang II renders claim 1 obvious.

A. Summary of Chang

Chang relates to “a hub with a host-to-host transmission function.” Ex. 1014 ¶ 1. More specifically, Chang teaches, “[f]or implementing a host-to-host transmission function, [having] a hub [which] comprises an uplink port and a host port for being linked [to] a host respectively, a hub

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control unit connected to the uplink port, and a bridge connected between the host port and hub control unit for the hosts [to] communicate with each other.” *Id.* at code (57).

B. Summary of Chang II

Chang II relates to “a bridge device for transmitting data; and more particular to a data transmission bridge device and control chip thereof for transmitting data that adopts USB specification, and can utilize switching to bridge between two host devices for transmitting data.” Ex. 1015 ¶ 2. In particular, upon detecting the connecting device type (host/slave), the data transmission bridge device automatically switches between different transmission paths, which not only support data transfer between a host device and a slave device (host-to-device communication), but they also can directly support data transfer between two host devices (host-to-host communication). *Id.* ¶¶ 11–12.

C. Challenged Claim 1

1. Method

Claim 1’s preamble recites “[a] method.” Ex. 1009, 9:15. We agree with Petitioner and find that the combination of Chang and Chang II teaches a method. *See* Pet. 52; *id.* at 52–72 (describing how the combination teaches the steps of claim 1).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner, we are persuaded that Petitioner shows by a preponderance of the evidence that the combination of Chang and Chang II teaches claim 1’s preamble. In light of our finding, we need not, and thus do not, reach whether claim 1’s preamble is limiting.

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2. Providing Efficient Communications Among USB Components

Claim 1 further recites “providing efficient communications among USB components of a data communication system that includes a first input port, a second input port, a USB hub, a USB bridge connected to the USB hub.” Ex. 1009, 9:16–19. We agree with Petitioner and find that Chang teaches this limitation. Pet. 52–58.

First, we agree with Petitioner and find that Chang teaches that a USB cable enables “a communication channel between two computers . . . [which is] simpler and more efficient” than linking the computers via a local area network. Pet. 52–53; Ex. 1014 ¶ 2. We also agree with Petitioner and find that in the context of claim 1, providing efficient communications follows from the claimed arrangement and functioning of the claimed USB components. Pet. 53.

Second, we agree with Petitioner and find that Chang teaches “a first input port, second input port, a USB hub, [and] a USB bridge connected to the USB hub.” Pet. 54–58. In particular, Chang’s Figure 3, shown below as annotated by Petitioner, illustrates these components.

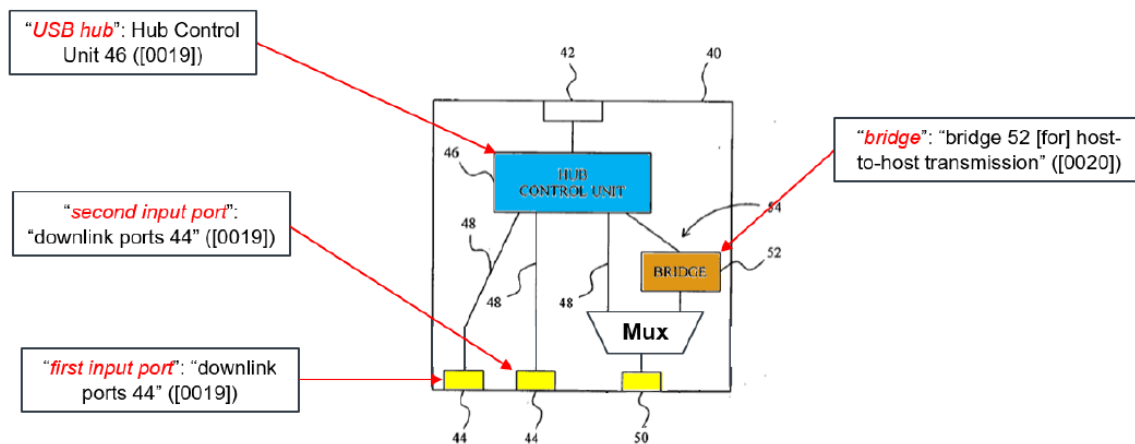


FIG. 3

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Figure 3 “is a schematic view of a hub according to” Chang’s teachings. Ex. 1014 ¶ 14. Petitioner annotates in relevant part for this limitation the figure by coloring in (i) yellow downlink ports 44, (ii) orange bridge 52, and (iii) blue hub control unit 46. Pet. 56–57 (annotating Ex. 1014, Fig. 3). Petitioner also maps²² components to the claim limitation by labeling (i) the left downlink port 44 as “first input port,” (ii) the right downlink port 44 as “second input port,” (iii) hub control unit 46 as “USB hub,” (iv) and bridge 52 as “bridge.” *Id.*

Chang teaches that the illustrated hub 40 comprises “several downlink ports 44 for being linked to devices, and a hub control unit 46 for establishing several transmission paths 48 between [an] uplink port 42 and downlink ports 44.” Ex. 1014 ¶ 19. In addition, Chang teaches that “bridge 52 [is] connected between the hub control unit 46 and host port 50” to allow for “a host-to-host transmission path 54 . . . such that the uplink port 42 may communicate with the host port 50.” *Id.* ¶ 20.

We find unavailing Patent Owner’s arguments that hub control unit 46 cannot be the claimed USB hub. PO Resp. 37 (citing Ex. 2019 ¶ 97). In particular, we find unavailing Patent Owner’s argument that “Chang expressly identifies USB Hub 40—not its subcomponent, Hub Control Unit 46—as its USB hub.” *Id.* (citing Ex. 1014 ¶ 19; Ex. 2019 ¶ 97). Patent Owner incorrectly focuses on how the components are named, rather than focusing on their functionality and structure. *See In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009) (a reference does not have to satisfy an *ipsis*

²² Petitioner provides an alternative mapping of Chang to this claim limitation where hub 40 is the claimed USB hub. We need not, and thus do not, address this alternative mapping because we find Petitioner’s first mapping sufficient.

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verbis test to disclose a claimed element). Petitioner’s arguments for claim 1 show that hub control unit 46 meets the limitations of claim 1 as to the claimed USB hub.

We also find unavailing Patent Owner’s argument that “Petitioner simultaneously identifies both USB Hub 46 and USB Hub 40 as the claimed USB Hub.” PO Resp. 37 (citing Pet. 47–52, 49; Ex. 2021,²³ 137:10–20; Ex. 2019 ¶ 97). Rather, as Petitioner argues, we find that Petitioner presents alternative theories. *See* Pet. Reply 19 (citing Pet. 48–50, 54–58). Herein, we analyze the theory that maps hub control unit 46 to the claimed USB hub.

We also find unavailing Patent Owner’s argument that “Petitioner’s expert . . . testified that Chang’s control unit 46 does not satisfy the definition of a hub in” claim 1. PO Resp. 37 (citing Ex. 2021, 215:6–23; Ex. 2019 ¶ 97). This testimony relates to claim 1 of the ’420 patent, which is a patent related to the ’072 patent. Ex. 2021, 215:6–23. The ’420 patent’s claim 1 is directed to a “USB[] hub module.” Ex. 1003, 9:11. We agree with Petitioner that this testimony is directed to hub control unit 46 not being the claimed hub module, rather than not being the USB hub of claim 1 of the ’072 patent. Ex. 2021, 215:6–23; Ex. 1102, 3 n.1.

In sum, we find that Petitioner shows by a preponderance of the evidence that Chang teaches this limitation.

3. Embedded USB Host

Claim 1 further recites “an embedded USB host connected to the USB hub.” Ex. 1009, 9:19–20. We agree with Petitioner and find that Chang teaches this limitation. Pet. 58–60.

²³ Deposition Transcript of Eric Welch (Oct. 10, 2024).

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In particular, we find that Chang teaches having “uplink port 42 . . . being linked to a host.” Ex. 1014 ¶ 19. Moreover, Chang teaches that “[w]ith the hub control unit 46 and bridge 52, a host-to-host transmission path 54 may be established such that the uplink port 42 may communicate with the host port 50,” and “[a]s such, the host linked to the uplink port 42 can communicate with the host linked to the host port 50.” *Id.* ¶ 20; *see also id.* at Fig. 3 (showing that uplink port 42 is connected to hub control unit 46 (i.e., the claimed USB hub)).

In addition, we agree with Petitioner that “Chang broadly discloses its invention in the context of a USB hub that allows for a host-to-host connection, without restriction as to the type of host which will connect to uplink port 42.” Pet. 59 (citing Ex. 1014 ¶¶ 1, 3, 20). And we agree with Petitioner and find that USB automotive applications were known in the art before the invention of the ’072 patent, including vehicles that employed USB-compatible embedded host computers in the form of infotainment systems. Ex. 1013 ¶ 102; Ex. 1029, 1:20–25 (“Vehicles typically include . . . an in-vehicle entertainment system.”), 27:4–55 (teaching a USB connector or interface may be embedded in vehicle control system, which “could be classified as an embedded host”), Figs. 1, 3, 27–30 (showing various embodiments for a vehicle control system connecting via a USB interface to various remote sources); Ex. 1049,²⁴ 1 (“To utilise USB inside the automobile, either the portable consumer device or the infotainment system must contain a USB host to control the flow of data.”); Pet. 14–15, 58. We appropriately consider such evidence of the knowledge that one of

²⁴ *USB in Automotive: No Longer Just for PCs*, Brian Ellis, Cypress Semiconductor Corp., Electronic Product News (Sept. 1, 2006).

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ordinary skill in the art would have had as part of our obviousness analysis. *See Randall Mfg.*, 733 F.3d at 1362–63.

Accordingly, we find persuasive the testimony of Mr. Welch that one of ordinary skill in the art “viewing Chang would have understood its application to the vehicle context and would have found it obvious to use Chang’s system in a vehicle,” and “[m]ore particularly, it would have been obvious to connect Chang’s system (and . . . [the] modified Chang/Chang II hub) to an embedded host in the vehicle context.” Ex. 1013 ¶ 240; *KSR*, 550 U.S. at 421 (“When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.”).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner, we are persuaded that Petitioner shows by a preponderance of the evidence that Chang teaches “an embedded USB host connected to the USB hub” to one of ordinary skill in the art.

4. USB Port Connected to a USB Device

Claim 1 further recites “a USB port connected to a USB device capable of operating in a USB Host mode and a USB device mode, and USB multiplexing switches connected to the USB port, the USB hub, and the USB bridge.” Ex. 1009, 9:20–10:4. We agree with Petitioner and find that the combination of Chang and Chang II teaches this limitation. Pet. 8–12, 42–48, 60–65.

In particular, we agree with Petitioner that this limitation is taught by the proposed combination of Chang and Chang II, which modifies Chang with Chang II’s teachings to include (i) a dual-role port connected to a

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dual-role device and (ii) a Mux to route the port to the appropriate transmission path. Petitioner illustrates its combination by modifying Chang's Figure 3, shown below truncated to the portions relevant to this limitation. Pet. 65 (modifying and annotating Ex. 1014, Fig. 3).

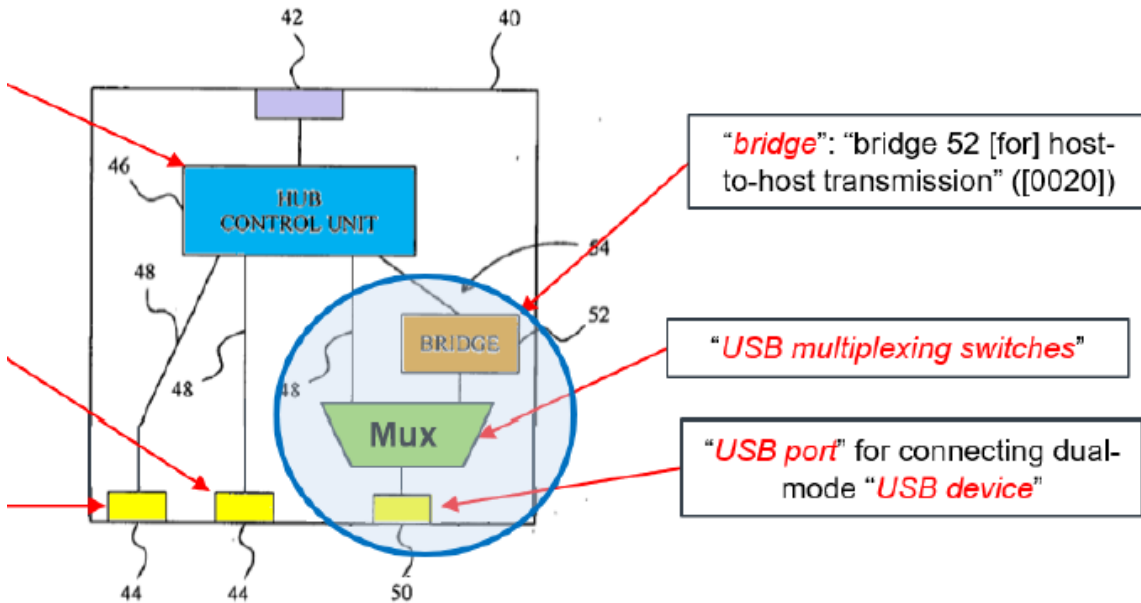


FIG. 3

Figure 3 “is a schematic view of a hub according to” Chang’s teachings. Ex. 1014 ¶ 14. Petitioner modifies the figure by adding a Mux,²⁵ which is connected to (i) port 50 at the input of the Mux and (ii) hub control unit 46 and bridge 52 at its output. Pet. 65. Petitioner draws a blue shaded circle around bridge 52, the Mux, and port 50. *Id.* Also, Petitioner labels (i) port 50 as “‘USB port’ for connecting dual-mode ‘USB device,’” (ii) Mux as

²⁵ Chang II teaches using a bypass circuit unit, a detection unit, and a central processing unit (CPU) for switching between the two paths. *E.g.*, Ex. 1015 ¶¶ 21, 34–40. Petitioner argues that it would have been obvious to accomplish the switching using a Mux as illustrated in the annotated figure. See Pet. 64. We address below arguments concerning this substitution. See *infra* Section VI.C.4.b.

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“USB multiplexing switches,” and (iii) bridge 52 as “bridge.” *Id.* (emphasis omitted).

a. USB Port

We agree with Petitioner that Chang II teaches providing “a USB port connected to a USB device capable of operating in a USB Host mode and a USB device mode.” Pet. 9–10, 60–65. In particular, we find that Chang II teaches providing a single port that allows a connected USB product to act either as a host device or a slave device. *See, e.g.*, Ex. 1015 ¶¶ 11 (“automatically detect the connecting device type”), 21 (“automatically detecting the type of device connected (host or slave)”), 22 (teaching that a “connection interface . . . is for connecting to a second host device . . . or a slave device”), 29–30 (teaching that a “dual connector type design” or an “adapter” can be used so that either a host device or a slave device can be connected to the interface).

Moreover, Chang II teaches that the first and second connection interfaces can each use an A-Type USB male connector to connect two host devices. Ex. 1015 ¶ 29. But Chang II also teaches that if a slave device (normally a B-Type USB female connector) needs to connect, then an adapter can be further attached to the second connection interface’s A-Type USB male connector to provide a B-Type male connector. *Id.* Hence, Chang II teaches a single port for connecting a host device or a slave device.

Moreover, we agree with Petitioner that dual-role devices (i.e., devices that can function as a host and slave) were well-known to one of ordinary skill in the art before the effective filing date of the ’072 patent. Pet. 9; Ex. 1013 ¶¶ 69–73; Ex. 1016,²⁶ code 57 (discussing “dual-role

²⁶ US 2004/0019732 A1, published Jan. 29, 2004.

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devices (OTG devices)"); Ex. 1022, § 1.1 ("An OTG product is a portable device that uses a single Micro-AB receptacle (and no other USB receptacles) to operate at times as a USB Targeted Host and at times as a USB peripheral."); Ex. 1032²⁷ ¶¶ 7, 52, 102 (discussing dual-role peripheral devices); Ex. 1033²⁸ ¶ 40 (discussing OTG devices). In fact, the '072 patent acknowledges that "leading mobile device manufacturers and system designers ha[d] begun designing their mobile device products (i.e., smart phones, tablets, etc.) to support both USB Host and USB Device roles." Ex. 1009, 2:59–62. We also note that because dual-role devices were well-known, it follows that connectors for such devices also would have been well-known.

Accordingly, in light of the above, we agree with Petitioner that one of ordinary skill in the art would have found it obvious to connect a dual-role product to Chang II's second interface connection using a single dual-role connector. Pet. 62 (citing Ex. 1013 ¶¶ 250–253). In other words, it would have been obvious to substitute a well-known dual-role device (e.g., a mobile device) for a single-role device using one dual-role connector (e.g., a Micro-AB connector) when connecting to a dual-role port, such as Chang II's port. See *KSR*, 550 U.S. at 417 (finding obvious "the simple substitution of one known element for another"); see also *id.* at 421 ("When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.").

²⁷ US 2008/0005262 A1, published Jan. 3, 2008.

²⁸ US 2007/0255885 A1, published Nov. 1, 2007.

b. USB Multiplexing Switches

We agree with Petitioner and find that the combination of Chang and Chang II renders obvious providing “USB multiplexing switches connected to the USB port, the USB hub, and the USB bridge.” Pet. 9–10, 60–65. In particular, we find that Chang II teaches “switch[ing] between different transmission paths,” depending on the connected device. *E.g.*, Ex. 1015, code (57), ¶¶ 11, 21. More specifically, Chang II teaches providing “two different transmission paths, so that by automatically detecting the type of device connected (host or slave)[, its] invention can switch to the proper transmission path, [and] thus not only can host-slave operation between [a] host device and [a] slave device be supported, but direct bridging between two host device[s] for data transfer is also possible.” *Id.* ¶ 21. Figure 5, shown below, shows an embodiment in accordance with this teaching.

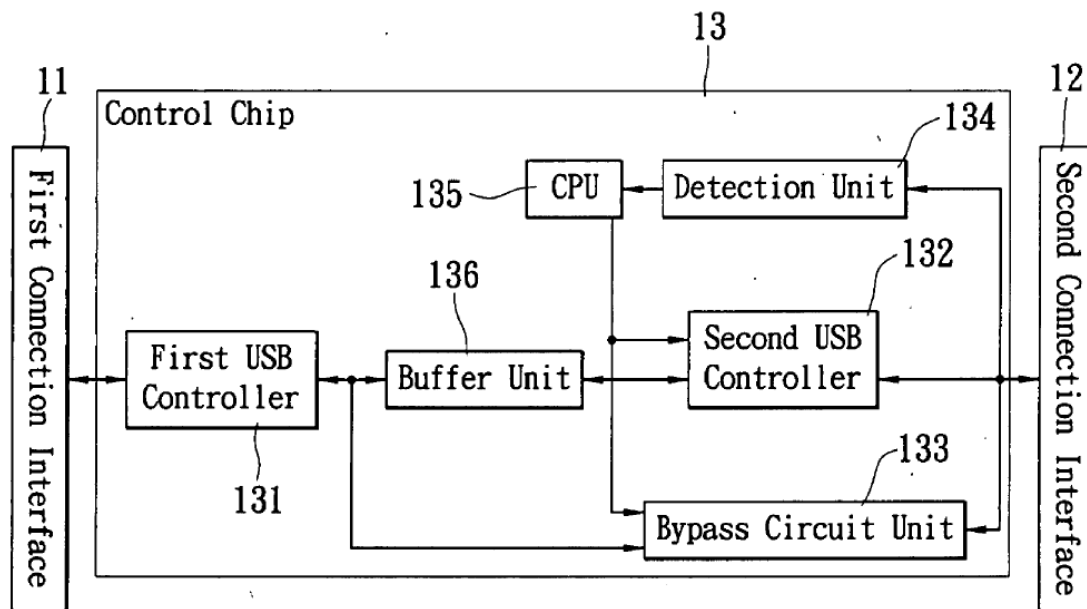


FIG. 5

Figure 5 “shows an embodiment of a schematic diagram for a control chip for a data transmission bridge device for transmitting data according to”

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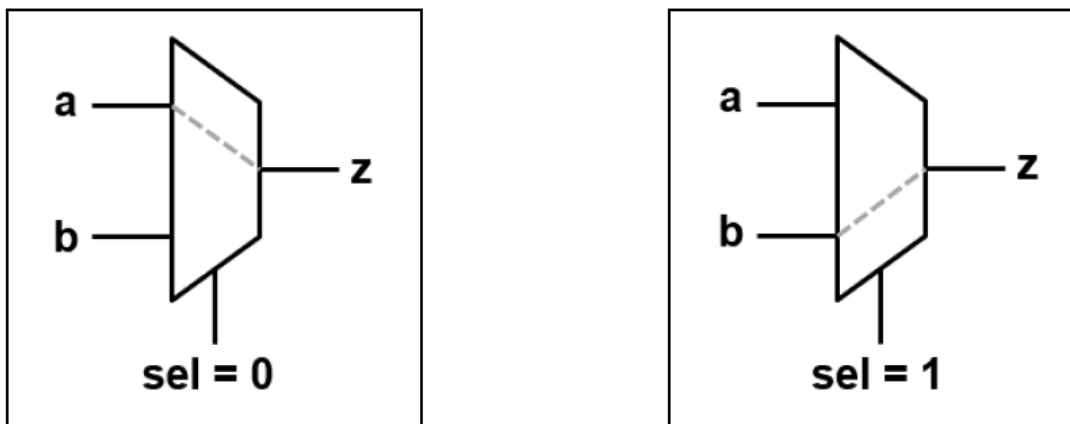
Chang II's teachings. *Id.* ¶ 19. As shown, control chip 13 “includes: a first USB controller 131, a second USB controller 132, a bypass circuit unit 133, a detection unit 134, a central processing unit (CPU) 135, and a buffer unit 136.” *Id.* ¶ 34. Also as illustrated, “[t]he first USB controller 131 connects to [a] first connection interface 11” and “[t]he second USB controller 132 couples to the first USB controller 132[, via the buffer unit 136,] and connects to the second connection interface 12.” *Id.* ¶¶ 35–36. Chang II teaches that “thus the second USB controller 132 coupled with the first USB controller 131 forms a transmission bridge” (i.e., a host path). *Id.* ¶ 36.

In addition, Chang II teaches that “[t]he bypass circuit unit 133 is connected between the first USB controller 131 and the second connection interface 12, such that when the second connection interface 12 is connected with a slave device 4, a direct connection between the first USB controller 131 and the second connection interface 12 can be made” (i.e., a slave path). *Id.* ¶ 37. “The [d]etection unit 134 is also connected to the second connection interface 12,” and “determine[s] the type of device currently connected with the second connection interface 12, and a detection signal (bridging detection signal or slave detection signal) is produced accordingly.” *Id.* ¶ 38. And “the CPU 135 is for receiving the detection signal, and then according to the detection signal controls the operation of either the second USB controller 132 or the bypass circuit unit 133.” *Id.* In other words, Chang II teaches switching between (i) the first USB controller 131 and the second USB controller 132 bridge path (two hosts) and (ii) the first USB controller 131 and the bypass circuit unit 133 path (host and slave). *Id.* ¶¶ 35–40.

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In addition, we agree with Petitioner that “numerous USB multiplexing switching products were well-known and available by 2013.” Pet. 64; Ex. 1059,²⁹ 1–2 (listing USB multiplexing switches, including 2:1 switch configurations); Ex. 1060,³⁰ 1 (“The FSUSB63 is a bi-directional, low-power, High-Speed (HS) USB 2.0 3:1 Multiplexer (MUX).”). We also find persuasive Mr. Welch’s explanation of the operation of a 2:1 multiplexing switch, illustrated below. Ex. 1013 ¶ 89.



The figures collectively show the operation of a 2:1 Mux with (i) inputs “a” and “b,” (ii) output “z,” and (iii) “sel” control signal having a zero or one value. *Id.* Mr. Welch explains that this “multiplexing switch enables connecting either input ‘a’ or ‘b’ to output ‘z’ via the ‘sel’ (select) control signal.” *Id.*

Moreover, we agree with Petitioner and find that it was well-known to use multiplexing switches “for the specific purpose of routing USB communications emanating from a product to the appropriate path upon detection of whether the product is operating in host or device mode.” Pet.

²⁹ Fairchild Semiconductor USB Switch listing (Oct. 16, 2011), *Internet Archive Wayback Machine*, retrieved Aug. 25, 2023.

³⁰ Fairchild Semiconductor FSUSB63 3:1 High-Speed USB 2.0 Switch / Multiplexer datasheet (Nov. 2010).

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11–12; Ex. 1013 ¶ 95; Ex. 1017³¹ ¶¶ 56–57, Fig. 6 (teaching a crossbar switch that routes connected USB devices depending on whether they are operating in host or device mode); Ex. 1052,³² Fig. 1, 3:7–20 (teaching a “switching structure” (e.g., “multiplexors”) to route USB ports to the appropriate path depending on host or device detection); Ex. 1053,³³ Fig. 1, ¶¶ 31–34 (teaching switching data line connections based on host/device mode detection).

In light of the above, we agree with Petitioner and find that it would have been obvious to employ multiplexing switches for switching between the bridge path (when a host connects) or bypass path (when a device connects). Pet. 62–64; Ex. 1013 ¶¶ 255–260. In particular, USB multiplexing switching products were well-known and routed connected devices like the routings produced by Chang II’s bypass circuit unit, detection unit, and CPU. *Compare* Ex. 1015 ¶¶ 34–40, Fig. 5 (teaching connecting a port (i.e., port 50) to either of two transmission paths based on a detection signal), *with* Ex. 1013 ¶ 89 (describing the operation of a 2:1 multiplexer switch). Moreover, as we discuss above, it was well-known to use multiplexing switches for routing USB communications based on whether a product is operating in host or device mode. Thus, using the multiplexing switches to perform the switching operations would have been obvious. *See KSR*, 550 U.S. at 417 (finding obvious “the simple substitution of one known element for another”).

³¹ US 2006/0195625 A1, published Aug. 31, 2006.

³² US 9,864,711 B2, issued Jan. 9, 2018 (Ex. 1052).

³³ US 2004/0088449 A1, published May 6, 2004 (Ex. 1053).

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In addition, we agree with Petitioner and find that the USB multiplexing switches (Mux) are connected to the USB port (port 50), the USB hub (hub control unit 46), and the USB bridge (bridge 52). Pet. 44–46, 64–65. Petitioner’s placement of the Mux is consistent with Chang’s teachings of having a separate path for dedicated ports 44 (connecting to hub control unit 46 without traversing bridge 52) and a separate path for port 50 (connecting via bridge 52 to hub control unit 46). *See, e.g.*, Ex. 1014, Fig. 3. Chang II similarly teaches including, or not including, the bridge in the paths depending on the connected device (i.e., host or slave). *See, e.g.*, Ex. 1015, Fig. 5.

In addition, we agree with Petitioner that the proposed multiplexing switches (Mux) are “USB multiplexing switches” because they switch “USB” lines. Pet. 62 n.20; Ex. 1013 ¶ 255. In particular, we agree and find that “a USB connection includes two data lines,” and thus, “typical USB switches will include at least two switches, *e.g.*, to switch (select) among D+ lines and to switch (select) among D- lines.” Pet. 64; Ex. 1060, 1; Ex. 1013 ¶ 259. Below we provide an illustration, as annotated by Petitioner, of a commercially available Mux. Pet. 64.

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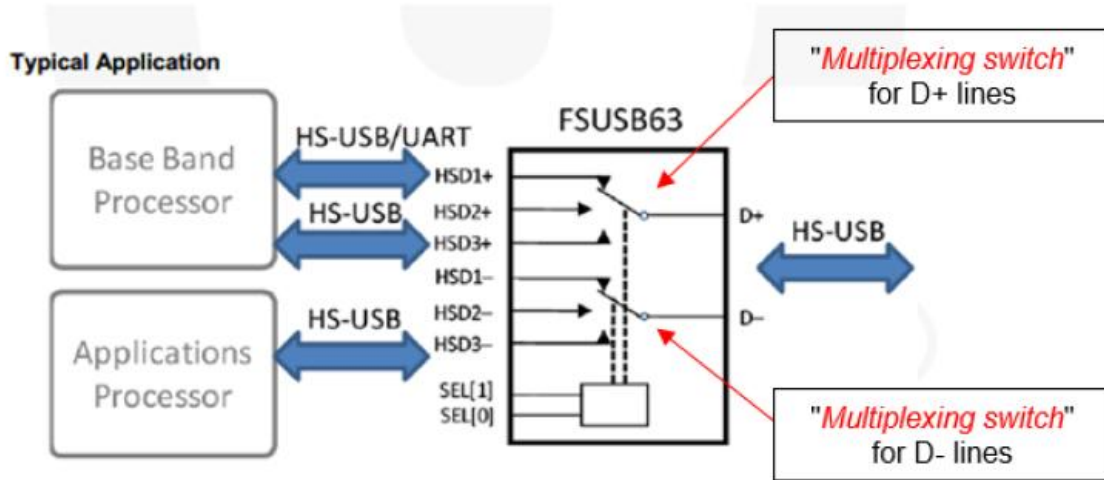


Figure 1. Analog Symbol

Figure 1 shows a 3:1 USB multiplexer in a typical application taken from a FSUSB63 datasheet, as annotated by Petitioner. Pet. 64 (annotating Ex. 1060, 1 (Fig. 1)). Petitioner labels (i) a switch that selects among D+ lines (i.e., HSD1+, HSD2+, HSD3+) as “‘Multiplexing switch’ for D+ lines,” and (ii) a switch that selects among D- lines (i.e., HSD1-, HSD2-, HSD3-) as “‘Multiplexing switch’ for D- lines.” *Id.* This showing supports that multiple switches are used in a Mux to switch (select) “USB” lines.

We find unavailing Patent Owner’s arguments that the proposed Mux includes only a single multiplexing switch. PO Resp. 37–41. Patent Owner incorrectly focuses on how Muxes are named (e.g. a 3:1 USB “Switch”), rather than focusing on their functionality and structure. *Id.* at 39–40; see *In re Gleave*, 560 F.3d at 1334 (a reference does not have to satisfy an *ipsis verbis* test to disclose a claimed element). But as illustrated above, these USB Muxes have a switch for the D+ lines and a second switch for the D- lines, and thus such Muxes teach “USB multiplexing switches.” Similarly, Patent Owner incorrectly focuses on testimony from Mr. Welch in another

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proceeding where he refers to a commercial Mux datasheet³⁴ as showing a “2:1 high-speed USB 2.0 *multiplexer switch*,” rather than focusing on the structure of that Mux. PO Resp. 41 (citing Ex. 2012³⁵ ¶ 272). This datasheet also shows having a switch for the D+ lines and a second switch for the D- lines. See Ex. 1068, 1 (Fig. 1).

We also find unavailing Patent Owner’s argument that the claimed multiplexing switches “are absent from Chang and Chang II, and are instead supplied from [one of ordinary skill’s] alleged knowledge.” PO Resp. 19 (citing Pet. 44–52; Ex. 2019 ¶ 73). As we discuss above, one of ordinary skill would have understood that using multiplexing switches—in lieu of Chang II’s bypass circuit unit and detection unit—for switching between the paths was a suitable option, which is sufficient. See *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1381 (Fed. Cir. 2023) (finding sufficient for obviousness showing that the combination was a suitable option).

Moreover, Chang II undisputedly teaches switching between the paths depending on the connected device, as we discuss above. *E.g.*, Ex. 1015 ¶¶ 11, 21. In light of this teaching, coupled with the knowledge of one of ordinary skill in the art we discuss above, it would have been obvious to employ multiplexing switches for switching between the paths. See Ex. 1013 ¶¶ 89, 95, 255–258; Ex. 1017 ¶¶ 56–57, Fig. 6; Ex. 1052, Fig. 1, 3:7–20; Ex. 1053, Fig. 1, ¶¶ 31–34; *Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 1338 (Fed. Cir. 2020) (finding obviousness can rely on supported expert testimony to supply an element of a claim).

³⁴ Fairchild Semiconductor FSUSB30 Low-Power, Two-port, High-Speed USB 2.0 (480 Mbps) Switch (Sept. 2008) (Ex. 1068).

³⁵ Declaration of Eric Welch in *Microchip Tech. Inc. v. Aptiv Techs. AG*, IPR2024-00229 (PTAB) (Ex. 1013).

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We also find unavailing Patent Owner’s argument that “[t]he claimed routing steps cannot be met by off-the-shelf switching components alone.” PO Resp. 20 (citing Ex. 2019 ¶ 74). Rather, as we discuss above, it was well-known to use multiplexing switches for routing USB communications emanating from a product to the appropriate path upon detection of whether the product is operating in host or device mode. And again, Chang II teaches switching between connection paths—including or bypassing the bridge—depending on the connected device (i.e., host or slave) detected. Patent Owner incorrectly focuses on individual teachings, rather than the combined teachings Petitioner argues. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

We also find unavailing Patent Owner’s argument that “[t]he Petition fails to show how generic switching elements—multiplexers—would be combined with Chang and Chang II to meet” the receiving and routing limitations of claim 1. PO Resp. 20 (citing Ex. 2019 ¶ 75). Similarly, Patent Owner argues that “multiplexers rely on control signals (‘select lines’) to configure which input(s) are routed to which output(s),” but Petitioner fails to “explain[] with particularity how the control signals of the multiplexer would implement the claimed method steps.” *Id.* at 21–22; *see also id.* at 22 (citing Pet. 47 n.17; Ex. 2019 ¶¶ 77–78) (arguing that Petitioner provides limited and nonspecific evidence as to control signals and “how the detection unit of Chang II would be utilized by the multiplexer in the proposed combination”).

Simply put, Patent Owner fails to consider that the skilled artisan is not an automaton so that “the inferences and creative steps that a person of ordinary skill in the art would employ” must be taken into account. *See*

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KSR, 550 U.S. at 418. We find persuasive Petitioner’s argument that “[i]t would have been routine and obvious for the detection unit . . . to control the switching functionality,” including the select lines of the switch. Pet. 47 n.17 (citing Ex. 1013 ¶ 193). For example, Chang II teaches that its detection unit produces detection signals indicating whether a host or slave device is connected to the second connection interface. See Ex. 1015 ¶¶ 27, 38, Fig. 5. We credit Mr. Welch’s testimony that the detection unit ultimately controls the Mux’s select line, as it is consistent with Chang II’s teachings. Ex. 1013 ¶ 193. And as we discuss above, a 2:1 multiplexing switch’s “sel” control signal simply has a zero or one value to select between the two output paths. Ex. 1013 ¶ 89. In light of the teachings, we find that it would not have been uniquely challenging or difficult for one of ordinary skill in the art to add a Mux—a known, suitable option—to Chang and Chang II’s teachings in the manner Petitioner proposes resulting in the claimed switching functionality. See *Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR*, 550 U.S. at 419–20) (finding that obviousness was supported because there was no evidence that making the combination was uniquely challenging or difficult for one of ordinary skill in the art).

c. Combining Chang and Chang II

Petitioner modifies Chang with Chang II’s teachings to include a dual-role port and a Mux to route the port to the appropriate transmission path. We agree with Petitioner and find that it would have been obvious to substitute Chang II’s dual-role port for Chang’s port 50, as well as to include Chang II’s switching functionality. Pet. 42–44, 64–65; Ex. 1013 ¶¶ 184–185. In particular, we find persuasive Mr. Welch’s testimony that one of

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ordinary skill in the art would have been motivated to employ dual-role mode ports instead because employing dedicated ports requires having “*multiple connectors, multiple [application-specific integrated circuit (ASIC)] pins and the like,*” which adds ‘*overhead*’ and ‘*increase[s] the cost[s].*’” Ex. 1013 ¶ 177 (quoting Ex. 1025,³⁶ 1:36–43) (second and third alterations in original).

We also find persuasive Mr. Welch’s testimony that substituting Chang II’s dual-role port for Chang’s port 50 “avoids the inconvenience, hassle, and confusion of consumers having to keep track of (1) what mode their phone is operating in and (2) what mode(s) are supported by individual hub ports.” *Id.* ¶ 179; Pet. 44. As Mr. Welch testifies, “[w]ith a dual-role port, the user would not have to know what mode the smartphone was operating in, and then switch the smartphone between the appropriate dedicated host or device port.” Ex. 1013 ¶ 179. We find that this rationale also provides sufficient motivation for one of ordinary skill in the art to employ a dual-role port in lieu of host port 50.

In addition, we agree with Petitioner that “in view of a dual-role mode USB port, it would have been obvious to include ‘USB multiplexing switches connected to the USB port, the USB hub, and the USB bridge’ to route the downstream USB product to the appropriate path.” Pet. 62 (emphases omitted (internal footnote omitted)). This is consistent with Chang II’s teachings, which require such switching. *E.g.*, 1015 ¶¶ 11, 21. In other words, to realize the benefits of the rationales for using dual-role ports in Chang, one of ordinary skill in the art would have included a switch to route the downstream port to the appropriate path. *See* Ex. 1013 ¶¶ 184–

³⁶ US 8,683,085 B1, issued Mar. 25, 2014 (Ex. 1025, “Castleberry”).

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185. And as we discuss above, a 2:1 Mux is a suitable option for providing Chang II's switching functionality. *See supra* Section VI.C.4.b.

In addition, we agree with Petitioner and find that one of ordinary skill in the art would have had an expectation of success in modifying Chang to include dual-role ports and Mux switching. Pet. 44. As we discuss above, dual-role ports, host/device detection, and USB multiplexing switches for selecting paths were already well-known.

We find unavailing Patent Owner's argument that Petitioner's "proposed combination relies on Chang II's bridge device 1 and detection unit 134 to provide the control signals that cause the multiplexer to route the downstream ports through the appropriate transmission path." PO Resp. 24 (citing Pet. 66–72; Ex. 2019 ¶ 83); PO Sur-reply 4 (making similar argument). Patent Owner adds that "[a]s Chang II indicates, and as the Petition acknowledges, the detection unit is part of the control chip 13 of bridge device 1." PO Resp. 24 (citing Pet. 32–33; Ex. 1015, Figs. 1, 5, ¶¶ 34, 37–38, 40; Ex. 2019 ¶ 83). In addition, Patent Owner argues that the detection unit 134 executes the process shown in Chang II's Figure 6 to generate a detection signal. *Id.* (citing Pet. 33–34, 45; Ex. 1013 ¶¶ 159, 250–251, 263, 267; Ex. 1015, Fig. 6, ¶ 24; Ex. 2019 ¶ 84).

We find, however, that these arguments incorrectly describe how Petitioner combines the cited teachings. In particular, Petitioner does not bodily incorporate into Chang's teachings (i) Chang II's bridge device 1, (ii) that detection unit 134 is part of the control chip 13 of bridge device 1, or (iii) Chang II's Figure 6 process for generating detection signals. Rather, Petitioner applies to Chang Chang II's teachings of (i) having dual-role ports and (ii) switching between connection paths—including or bypassing the

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bridge—depending on the connected device (i.e., host or slave) detected. *See supra* Section VI.C.4. That Petitioner cites specific structures as examples of how Chang II teaches these items does not equate to bodily incorporating these structures into the proposed combination. *Cf. Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (quoting *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc)) (“Etter’s assertions that Azure cannot be incorporated in Ambrosio are basically irrelevant, the criterion being not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.”).

We also find unavailing Patent Owner’s argument that Petitioner’s “proposed combination includes a structural flaw.” PO Resp. 25. In particular, Patent Owner argues that “in the proposed combination, the detection unit (in Chang’s bridge 52) is *separated* from the downstream ports (i.e., 44, 50) by the routing switch—i.e., a multiplexer.” *Id.* (Ex. 2019 ¶ 85); *see also id.* at 26–34 (expanding on its structural flaw arguments). A premise of Patent Owner’s arguments appears to be that because Chang II’s detection unit is in the bridge control chip that the detection unit must be located in the bridge in Petitioner’s proposed combination. *Id.*

We disagree. Claim 1 is a method claim that addresses receiving USB signals from a dual-role device and routing those signals depending on the device mode (i.e., host mode or device mode). Ex. 1009, 9:15–10:18. Claim 1 does not recite detecting the mode, nor does it recite a detection unit. *Id.* Thus, Petitioner does not overly focus on the location of the detection unit.

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Petitioner, however, argues that “[i]t would have been routine and obvious for the detection unit and/or bridge to control the switching functionality” (i.e., routing to the appropriate path using a switch). Pet. 47 & n.17 (citing Ex. 1013 ¶ 193). To that end, Mr. Welch testifies as to examples of where it would have been obvious to deploy the detection circuitry. Ex. 1013 ¶ 193. For example, Mr. Welch testifies that the detection circuitry “could be separate and between the dual-role port 50 and mux,” which “is obvious because it is the first place a signal from a downstream USB product arrives.” *Id.* Or the detection circuitry “could be located in the bridge to take advantage of existing logic and circuitry,” Mr. Welch testifies. *Id.* (citations omitted); Pet. Reply 11–12. In particular, “Chang II’s bridge includes a ‘*detection unit*’ (in the control chip) that detects the mode of the downstream product for selection of the appropriate transmission path,” according to Mr. Welch. Ex. 1013 ¶ 193 (citing Ex. 1015 ¶¶ 22–23, 34, 38, Fig. 5). Notably, Mr. Welch testifies that “the detection unit must connect to the downstream port to detect the mode, as shown in Chang II.” *Id.*; *see also* Pet. Reply 11–12.

We find these arguments, and this testimony from Mr. Welch, persuasive as they are consistent with Chang II’s teachings regarding switching functionality discussed above, as well as Chang II’s Figure 5. *Compare* Ex. 1013 ¶ 193, *with* Ex. 1015 ¶¶ 22–23, 34, 38, Fig. 5. Figure 5 is shown below, as annotated by Petitioner.

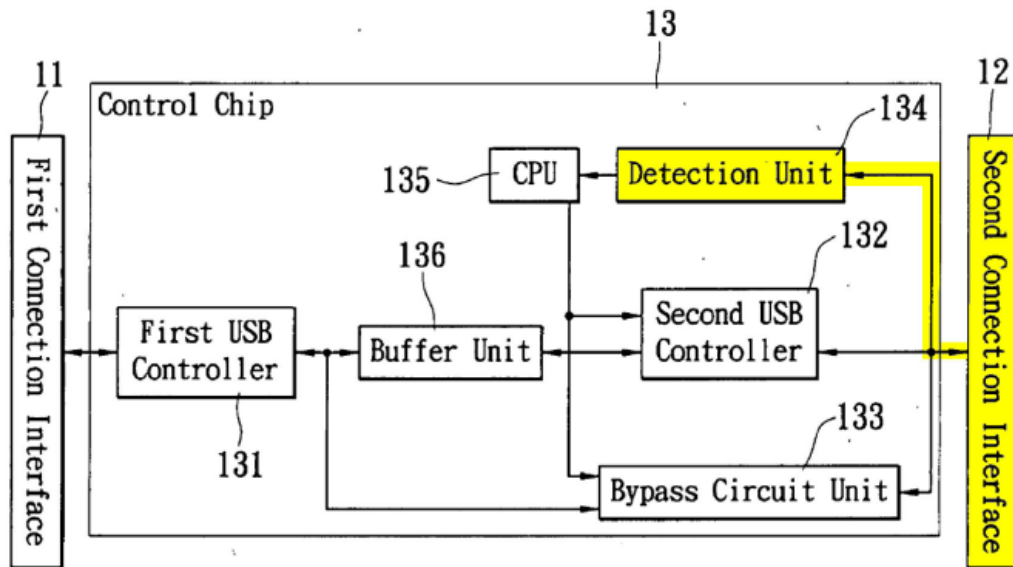


FIG. 5

Figure 5 “shows an embodiment of a schematic diagram for a control chip for a data transmission bridge device for transmitting data according to” Chang II’s teachings. Ex. 1015 ¶ 19. Petitioner annotates the figure by coloring in yellow detection unit 134, second connection interface 12, and the direct path between them. Pet. Reply 11. As shown, Chang II teaches that its detection unit 134 connects to second connection interface 12, which connects to the second device. *See, e.g.*, Ex. 1015, ¶ 38, Figs. 1, 4–5. In other words, the detection unit (even though part of Chang II’s “bridge”) directly connects to the downstream port (i.e., second connection interface 12).

Accordingly, we find unavailing Patent Owner’s arguments that Petitioner’s “proposed combination includes a structural flaw.” PO Resp. 25–34. Again, Petitioner’s combination, as we discuss above, does not have the detection unit separated from the downstream ports by the Mux. We also find unavailing Patent Owner’s arguments related to having a “dead state”—the proposed combination not being able to return to a host mode

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from a device mode because the bridge would have been electrically disconnected. *See id.* at 23–36, 46–48, 52–53. These dead state arguments are premised on the alleged “structural flaw,” which we do not find to be present.

We also find unavailing Patent Owner’s argument that Petitioner employs impermissible hindsight by taking a claims first approach to showing unpatentability. *See* PO Resp. 44–45. As we discuss above, we find that one of ordinary skill in the art would have been motivated to combine Chang and Chang II’s teachings in the manner Petitioner proposes.

We also find unavailing Patent Owner’s argument that “[t]he proposed combination is wasteful and inefficient” because it “takes existing USB solutions in Chang and Chang II; adds duplicative switching components and new electronic hardware; and disregards existing components.” *Id.* at 48 (citing Ex. 2019 ¶ 111). Patent Owner adds that “[e]ven though Chang II already includes, as its ‘main feature,’ circuitry for switching between two transmission paths, . . . the Petition proposes *further* modifying the Chang/Chang II combination to insert additional switching hardware, inside and outside of Chang’s hub.” *Id.* at 49 (citing Pet. 49; Ex. 1015 ¶ 21; Ex. 2019 ¶ 112). According to Patent Owner, “the Chang II control chip circuit is left intact, but neither the bypass circuit unit 133, nor the existing switching circuitry connecting to the bypass circuit unit, are utilized.” *Id.* at 50 (citing Ex. 1015, Fig. 5; Ex. 2019 ¶ 113). As we discuss above, these arguments incorrectly describe how Petitioner combines the cited teachings. Petitioner does not bodily incorporate Chang II’s control chip circuit into Chang’s hub. Instead, Petitioner applies Chang II’s teachings to Chang, and is not “compelled to adopt every single aspect of its

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teaching without the exercise of independent judgment.” *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 889 (Fed. Cir. 1984); *In re Mouttet*, 686 F.3d 1322, 1331 (Fed. Cir. 2012) (“A reference may be read for all that it teaches, including uses beyond its primary purpose.”). Moreover, Petitioner’s combination which adds dual role ports and switching functionality increases the usefulness and provided benefits of Chang’s system. We have considered these arguments and we determine that Petitioner’s proposed modifications to Chang (dual-role ports and a Mux) would not have been “wasteful and inefficient” as Patent Owner contends. *See* PO Resp. 52.

Accordingly, in light of the above, we find that Petitioner has provided sufficiently articulated reasoning with rational underpinning to support combining Chang and Chang II in the manner Petitioner proposes. *See Kahn*, 441 F.3d at 988; *see also Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1374 (Fed. Cir. 2019) (“A motivation to combine may be found ‘explicitly or implicitly in market forces; design incentives; . . . and the background knowledge, creativity, and common sense of the person of ordinary skill.’”) (quoting *ZUP, LLC v. Nash Mfg., Inc.*, 896 F.3d 1365, 1371 (Fed. Cir. 2018)).

d. Summary

In sum, we agree with Petitioner that the proposed combination of Chang and Chang II teaches “a USB port connected to a USB device capable of operating in a USB Host mode and a USB device mode, and USB multiplexing switches connected to the USB port, the USB hub, and the USB bridge.” We also find that Petitioner has provided sufficiently

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articulated reasoning with rational underpinning to support Petitioner’s combination.

5. Receiving a First USB Signal

Claim 1 further recites “receiving a first USB signal from the USB device via the USB port while the USB device is operating in the USB host mode.” Ex. 1009, 10:5–7. We agree with Petitioner and find that the combination of Chang and Chang II teaches this limitation. Pet. 66.

In particular, we agree with Petitioner that Chang teaches “allowing host-to-host communication through ‘a host-to-host transmission path 54 [that] may be established such that the uplink port 42 may communicate with the host port 50.’” Pet. 66 (quoting Ex. 1014 ¶ 20). In other words, the connected USB product sends USB signals to port 50. Ex. 1014 ¶ 20; Ex. 1013 ¶ 262.

We find unavailing Patent Owner’s dead state arguments as applied to this limitation. Again, these arguments are based on an incorrect premise. *See supra* Section VI.C.4.c.

In sum, we find that Petitioner shows by a preponderance of the evidence that the combination of Chang and Chang II teaches this limitation.

6. Routing the First USB Signal

Claim 1 further recites “routing the first USB signal via the USB multiplexing switches from the USB device to the embedded USB host through the USB bridge and the USB hub.” Ex. 1009, 10:8–10. We agree with Petitioner and find that the combination of Chang and Chang II teaches this limitation. Pet. 66–67.

In particular, we agree with Petitioner that Chang II teaches generating “a detection signal (bridging detection signal or slave detection

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signal)” and “then according to the detection signal control[ling] the operation of either the second USB controller 132 or the bypass circuit unit 133.” Pet. 67 (quoting Ex. 1015 ¶ 38). We also agree with Petitioner and find that one of ordinary skill in the art, “[a]pplying this teaching (and a [person of ordinary skill in the art]’s knowledge of switching . . .) to Chang, upon detection of the consumer product in host mode, the switch would connect the port to the bridge.” *Id.*; Ex. 1013 ¶ 263; *see also* Pet. 11–12 (arguing that multiplexing switches were well-known).

We also agree with Petitioner and find that the proposed combination teaches routing the first USB signal via the USB multiplexing switches (Mux) from the USB device (connected to port 50) to the embedded USB host (connected to uplink port 42) through the USB bridge (bridge 52) and the USB hub (hub control unit 46). Pet. 67 (annotating and modifying Ex. 1014, Fig. 3) (showing the routing path).

We find unavailing Patent Owner’s dead state arguments as applied to this limitation. Again, these arguments are based on an incorrect premise. *See supra* Section VI.C.4.c.

We also find unavailing Patent Owner’s argument that “the proposed combination does not rely on Chang II’s selection of ‘either the second USB controller 132 or the bypass circuit unit 133’; instead, it relies on the multiplexer to select an appropriate transmission path, with Chang II’s bypass circuit unit left unused.” PO Resp. 35. As we discuss above, Patent Owner incorrectly focuses on specific cited structures rather than Petitioner’s application of Chang II’s teachings. *See supra* Section VI.C.4.c.

In sum, we find that Petitioner shows by a preponderance of the evidence that the combination of Chang and Chang II teaches this limitation.

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7. Receiving a Second USB Signal

Claim 1 further recites “receiving a second USB signal from the USB device via the USB port while the USB device is operating in the USB device mode.” Ex. 1009, 10:11–13. We agree with Petitioner and find that the combination of Chang and Chang II teaches this limitation. Pet. 68–69.

In particular, we agree with Petitioner that Chang teaches “several transmission paths 48 between the uplink port 42 and downlink ports 44.” Pet. 68 (quoting Ex. 1014 ¶ 19). As we discuss above, we also agree with Petitioner and find that it would have been obvious to modify Chang to include dual-role ports for dual-mode USB products. *Id.*; see also *supra* Section VI.C.4.a (addressing including dual-role ports for dual-mode products). Accordingly, we agree with Petitioner and find that the proposed combination teaches receiving a second USB signal from the USB device (dual-role product) via the USB port (port 50) while the USB device is operating in the USB device mode. Pet. 68; Ex. 1013 ¶ 266.

We find unavailing Patent Owner’s dead state arguments as applied to this limitation. Again, these arguments are based on an incorrect premise. See *supra* Section VI.C.4.c.

In sum, we find that Petitioner shows by a preponderance of the evidence that the combination of Chang and Chang II teaches this limitation.

8. Routing the Second USB Signal

Claim 1 further recites “routing the second USB signal via the USB multiplexing switches from the USB device to the embedded USB host through the USB hub, wherein the second USB signal from the USB device to the embedded USB host bypasses the USB bridge.” Ex. 1009, 10:15–19.

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We agree with Petitioner and find that the combination of Chang and Chang II teaches this limitation. Pet. 69–71.

In particular, we agree with Petitioner that Chang II teaches generating “a detection signal (bridging detection signal or slave detection signal)” and “then according to the detection signal control[ling] the operation of either the second USB controller 132 or the bypass circuit unit 133.” *Id.* at 70 (quoting Ex. 1015 ¶ 38). We also agree with Petitioner and find that one of ordinary skill in the art, applying this teaching with the proposed combination of Chang and Chang II would have found it obvious to implement the switch to route USB signals to the embedded host by bypassing the bridge, upon detecting a product in device mode. *Id.*; Ex. 1013 ¶ 267. More specifically, we find that the proposed combination teaches routing the second USB signal via the USB multiplexing switches (Mux) from the USB device (connected to port 50) to the embedded USB host (connected to uplink port 42) through the USB hub (hub control unit 46), wherein the second USB signal from the USB device to the embedded USB host bypasses the USB bridge (bridge 52). Pet. 71 (annotating and modifying Ex. 1014, Fig. 3) (showing the routing path); Ex. 1013 ¶ 267.

We find unavailing Patent Owner’s dead state arguments as applied to this limitation. Again, these arguments are based on an incorrect premise. *See supra* Section VI.C.4.c.

We also find unavailing Patent Owner’s argument that “the proposed combination does not rely on Chang II’s selection of ‘either the second USB controller 132 or the bypass circuit unit 133’; instead, it relies on the multiplexer to select an appropriate transmission path with Chang II’s bypass circuit unit left unused.” PO Resp. 35. As we discuss above, Patent

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Owner incorrectly focuses on specific cited structures rather than Petitioner’s application of Chang II’s teachings. *See supra* Section VI.C.4.c.

In sum, we find that Petitioner shows by a preponderance of the evidence that the combination of Chang and Chang II teaches this limitation.

9. Summary

In sum, after reviewing the parties’ arguments and evidence, including any indicia of nonobviousness, we determine that Petitioner shows by a preponderance of evidence that claim 1 would have been obvious to one of ordinary skill in the art in view of the combination of Chang and Chang II.

VII. ALLEGED OBVIOUSNESS OVER CHANG, CHANG II, AND CHUTORASH

Petitioner argues that the combination of Chang, Chang II, and Chutorash renders claim 1 obvious. Pet. 72–76. Thus, this ground of unpatentability also challenges claim 1 which we already determine is unpatentable. *See supra* Section VI. Under the circumstances of this case, analyzing an additional ground challenging the same claim, which we have determined to be unpatentable, would not be an efficient use of the Board’s time and resources. *See Bos. Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App’x 984, 990 (Fed. Cir. 2020) (“We agree that the Board need not address issues that are not necessary to the resolution of the proceeding.”).

Accordingly, we do not reach this remaining ground. *Cf. In re Gleave*, 560 F.3d 1331, 1338 (Fed. Cir. 2009) (not reaching other grounds of unpatentability after affirming the anticipation ground); *see also Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (determining once a dispositive issue is decided, there is no need to decide other issues).

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VIII. PATENT OWNER’S MOTION TO STRIKE

Patent Owner moves to strike a section of Petitioner’s Reply (Section IV.A.3.b. (Pet. Reply 12–15)); paragraphs 6–17 and 44–57 of Exhibit 1102 (Reply Declaration of Eric Welch); and Exhibit 1103 (Excerpts from *The ART of Electronics*, P Horowitz and W. Hill, Cambridge University Press, 2nd Edition (1989)) in its entirety. Paper 35, 1. Petitioner opposes Patent Owner’s Motion to Strike. Paper 36. Patent Owner filed a reply to the opposition. Paper 37.

Patent Owner argues that “[t]he Board should grant the Motion because the Reply improperly presents new theories of unpatentability with belated supporting evidence that could have been present in the Petition itself.” Paper 35, 1. Patent Owner contends that, in response to an argument Patent Owner made in the Response that “Petitioner’s proposed prior art combination features a structural flaw” (*id.* at 2), Petitioner’s Reply improperly presents a new argument not found in the Petition (*id.* at 3–6). As discussed above, we find that Patent Owner’s structural flaw and dead end arguments fail, and thus, we do not reach the alleged new arguments and evidence that Patent Owner seeks to strike.

Accordingly, this motion is moot. For this reason, we deny Patent Owner’s Motion to Strike.

IX. PETITIONER’S MOTION TO EXCLUDE EVIDENCE

Petitioner filed a motion to exclude a number of Patent Owner’s exhibits (Exs. 2001–2003, 2005–2010, 2017, 2019, 2024–2028, and 2030–2043) for various reasons under the Federal Rules of Evidence (“FRE”). Paper 43 (“Mot.”), 1. Patent Owner filed an Opposition to the motion

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(Paper 45 (“Opp.”)), and Petitioner filed a Reply in support of the motion (Paper 46 (“Mot. Reply”)).

A. Exhibits 2001 and 2019 (Houh Declarations)

Exhibit 2001 is the Declaration of Henry Houh filed with Patent Owner’s Preliminary Response. Exhibit 2019 is the Supplemental Declaration of Henry Houh filed with Patent Owner’s Response. Petitioner argues, “[t]he Board should exclude Dr. Houh’s testimony in its entirety as impermissible expert testimony by a lay person (FRE 701/702) (*viz.*, expert testimony by a non-expert who does not satisfy the qualifications of a [person of ordinary skill in the art] and as being based on an incorrect [person of ordinary skill in the art] standard/definition, making it irrelevant, unreliable, and unfairly prejudicial.” Mot. 1. Petitioner’s request to exclude the Houh Declarations is based upon us accepting Petitioner’s contention that a person of ordinary skill in the art would have knowledge and experience with USB standards and the design and deployment of USB hosts, USB devices, and USB Hubs. *Id.* at 2 (“If the Board agrees [with Petitioner’s definition of a person of ordinary skill in the art], it should exclude Dr. Houh’s testimony because: (1) he rendered no opinions under the correct [person of ordinary skill in the art] definition; and (2) he lacks the qualifications of a [person of ordinary skill in the art].”), 3 (“Thus, if the Board agrees USB experience/knowledge is required, it should exclude Dr. Houh’s testimony as irrelevant and far more prejudicial than probative.”). As discussed above, we do not adopt Petitioner’s definition of a person of ordinary skill in the art. *See supra* Section II. Thus, these arguments fail.

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In addition, Petitioner argues that “[t]he Board should also exclude Dr. Houh’s secondary considerations testimony (re long-felt need, failure/skepticism of others, and copying) at ¶¶119–133 of EX2019 under *Daubert* [v. *Merrell Dow Pharms, Inc.*, 509 U.S. 579 (1993)] and FRE 403.” Mot. 1. However, these arguments are not well-developed and are largely skeletal and conclusory. Nonetheless, to the extent Petitioner’s argument is explained, we consider it.

With regard to long-felt need, Petitioner argues that Dr. Houh’s testimony does not establish that any alleged need was long-felt. *Id.* at 6. Petitioner argues:

[B]y Dr. Houh’s own admission ([Ex. 2019] ¶41), Apple informed “automakers of its plans to release a new technology known as CarPlay” “around 2013,” the same year the patent was filed. That cannot constitute long-felt need and Dr. Houh’s self-contradictory “long-felt need” testimony is a waste of time, unfairly prejudicial, unreliable, lacks foundation / personal knowledge, and should be excluded.

Id. Thus, Petitioner challenges Dr. Houh’s testimony on long-felt need on the merits. As discussed above, even considering Dr. Houh’s testimony, we find that Patent Owner fails to establish that there existed a long felt but unsatisfied need for the invention claimed in the ’072 patent. *See supra* Section V.B.1. Although we consider Petitioner’s challenge to these paragraphs to have some merit especially as Dr. Houh “lacks automotive industry expertise and has no independent knowledge or qualifications to opine on car makers’ wishes” (*id.*), it is unnecessary to exclude this testimony as requested by Petitioner as we find in Petitioner’s favor on long-felt need even considering this testimony and giving it appropriate weight.

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In addition, Petitioner requests that we exclude paragraphs 124–126 of Dr. Houh’s testimony related to failure/skepticism of others. Mot. 6. However, in arguing “[f]ailure of others/skepticism of skilled artisans,” Patent Owner does not discuss, cite, or otherwise rely on this testimony from Dr. Houh. See PO Resp. 59–63. Petitioner does not direct our attention to any use of this testimony by Patent Owner. See Mot. 6. Accordingly, we do not consider this testimony in determining whether Patent Owner has shown “[f]ailure of others/skepticism of skilled artisans.” See *supra* Section V.B.2.

In addition, Petitioner requests that we exclude paragraphs 127–133 of Dr. Houh’s testimony related to copying. Mot. 6–7. In its argument regarding copying, Patent Owner does not discuss, cite, or otherwise rely on these paragraphs, save paragraph 133. See PO Resp. 67–72. And, we do not rely on any of this testimony in deciding whether Patent Owner has shown copying. See *supra* Section V.B.5. In analyzing copying, we determine that Patent Owner’s allegations of copying by Petitioner are not well-supported without considering Dr. Houh’s testimony on copying. *Id.*

In sum, we deny Petitioner’s request to exclude, in whole or in part, Dr. Houh’s Declarations (Exhibits 2001 and 2019).

B. Exhibits 2002, 2003, 2017, and 2040–2043 (Trial Testimony)

Petitioner argues that we should exclude Exhibits 2002, 2003, 2017, and 2040–2043, which are trial testimony from a district court litigation between the parties. Mot. 7. More specifically, Petitioner argues that these exhibits “should be excluded under FRE 401 as irrelevant, under FRE 403 as misleading, confusing the issues, a waste of the parties’ and the Board’s resources/time on collateral matters, and as far more prejudicial than probative.” *Id.* at 7–8. We find these arguments unavailing. To the extent

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that we address these exhibits, we find that they have sufficient relevancy under FRE 401, and, under the circumstances here, a bench trial, Rule 403 has limited applicability. *See, e.g., Schultz v. Butcher III*, 24 F.3d 626, 632 (4th Cir. 1994).

In addition, Petitioner argues that we should exclude as inadmissible hearsay the prior trial testimony of (i) Mr. Voto from Exhibit 2003, (ii) Mr. Zatkovitch from Exhibit 2041, (iii) Dr. Becker from Exhibit 2041, and (iv) Mr. Dreon from Exhibit 2042. Mot. 8. We do not rely on the testimony Patent Owner cites from Mr. Voto. Nor do we rely on the testimony Patent Owner cites from Mr. Zatkovitch or Dr. Becker. We refer to Mr. Dreon’s testimony in our consideration of presumption of nexus—which we find Patent Owner does not establish—and in our consideration of failure of others and commercial success indicia for which this testimony is cumulative of other record evidence. Thus, we decline to address this argument. Lastly, as Petitioner acknowledges, Exhibits 2017 and 2043 are not cited by Patent Owner. *Id.* at 8, 14.

In sum, we deny Petitioner’s request to exclude, in whole or in part, Exhibits 2002, 2003, 2017, and 2040–2043.

C. Exhibits 2005–2010 and 2031–2035 (Emails)

Petitioner argues that we should exclude Exhibits 2005–2010 and 2031–2035, which are email threads between Petitioner’s personnel and/or with third parties. *Id.* at 10. More specifically, Petitioner argues that these emails are “lacking foundation (FRE 104), irrelevant (FRE 401), incomplete and misleading, confusing the issues, wasteful of the parties’ and Board’s resources/time on collateral matters, and far more prejudicial than probative (FRE 403), and lack of foundation / speculation (FRE 602).” *Id.* at 10–11.

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We find these arguments unavailing. To the extent that we address these exhibits, we find that have sufficient foundation and relevancy under FRE 401, and, under the circumstances here, a bench trial, Rule 403 has limited applicability. *See, e.g., Schultz*, 24 F.3d at 632. We note that we do not refer to above Exhibits 2031, 2032, 2034, and 2035.

In sum, we deny Petitioner’s request to exclude Exhibits 2005–2010 and 2031–2035.

D. Exhibits 2024, 2025, 2027, and 2028 (Development Documents)

Petitioner argues that we should exclude Exhibits 2024, 2025, 2027, and 2028, which are technical Patent Owner product development documents. Mot. 14. More specifically, Petitioner argues that these development documents are “irrelevant, incomplete (FRE 106), misleading, confusing the issues and wasteful of the parties’ and the Board’s resources/time on collateral matters, and far more prejudicial than probative (FRE 403).” *Id.*

We find these arguments unavailing. To the extent that we address these exhibits, we find that have sufficient foundation and relevancy under FRE 401, and, under the circumstances here, a bench trial, Rule 403 has limited applicability. *See, e.g., Schultz*, 24 F.3d at 632. We note that we do not refer to above Exhibits 2024 and 2025.

In sum, we deny Petitioner’s request to exclude Exhibits 2024, 2025, 2027, and 2028.

E. Exhibits 2026 and 2030 (Petitioner Product Documents)

Petitioner argues that we should exclude Exhibits 2026 and 2030, which are technical Petitioner product documents. Mot. 14–15. More specifically, Petitioner argues that these documents are “irrelevant (FRE

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401) and misleading, confusing the issues, wasteful of the parties’ and the Board’s resources/time on collateral matters, and far more prejudicial than probative (FRE 403).” *Id.* at 14. We do not refer above to these exhibits, and we deny Petitioner’s request to exclude them.

F. Exhibits 2036–2039 (Dreon Documents)

Petitioner argues that we should exclude Exhibits 2036–2039, which are the Declaration of Michael Dreon and attached Exhibits A–C, respectively. Mot. 15. More specifically, Petitioner argues that these documents are “lacking foundation and context (FRE 104), lack[ing] of personal knowledge/ speculation (FRE 602), and containing hearsay (FRE 801/802).” *Id.* We do not refer above to Exhibits 2037 or 2039. As to Exhibit 2036, Mr. Dreon’s declaration includes testimony that Petitioner’s Motion does not address, and thus, we decline to exclude it as a whole. As to Exhibit 2038, we find that Mr. Dreon provides sufficient foundation and authentication, and we consider the judges’ citation as a verbal act. Ex. 2036 ¶ 7. Moreover, we view paragraph 9 of the declaration as cumulative of the judges’ citation (Ex. 2038), and we rely on the citation itself.

Accordingly, we deny Petitioner’s request to exclude Exhibits 2036–2039.

G. Summary

For the above reasons, we deny Petitioner’s Motion to Exclude Evidence (Paper 43).

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X. CONCLUSION³⁷

Based on the full record, we determine that Petitioner shows by a preponderance of the evidence that claim 1 would have been obvious in view of the combination of Chang and Chang II.

Claim(s)	35 U.S.C. §	Reference(s) /Basis	Claim(s) Shown Unpatentable	Claims Not Shown Unpatentable
1	103	Chang, Chang II	1	
1	103 ³⁸	Chang, Chang II, Chutorash		
Overall Outcome			1	

XI. ORDER

In consideration of the foregoing, it is hereby

ORDERED that, pursuant to 35 U.S.C. § 314(a), Petitioner has shown by a preponderance of the evidence that claim 1 of the '072 patent is unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Strike (Paper 35) and Petitioner's Motion to Exclude Evidence (Paper 43) are denied;

³⁷ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

³⁸ Because we determine that claim 1 is unpatentable over another ground, we decline to address it for this ground.

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FURTHER ORDERED that, no later than ten business days after the issuance of this Final Written Decision, the parties may file a joint motion to seal portions of this Final Written Decision, explaining why portions of it should remain under seal, and including as an attachment a redacted version of the Final Written Decision that can be made publicly available;

FURTHER ORDERED that the present decision shall remain under seal until any joint motion to seal the Final Written Decision is resolved;

FURTHER ORDERED that the present decision shall be made public if, after the expiration of the time for the parties to file a joint motion to seal, no such motion has been filed; and

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

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