

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC. AND JUNIPER NETWORKS, INC.,¹
Petitioner,

v.

ORCKIT CORPORATION,
Patent Owner.

IPR2023-00401
Patent 7,545,740 B2

Before KRISTEN L. DROESCH, NATHAN A. ENGELS, and
BRENT M. DOUGAL, *Administrative Patent Judges*.

DROESCH, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

¹ Juniper Networks, Inc. filed a motion for joinder and a petition in IPR20240-00034, which were granted. Accordingly, Juniper Networks, Inc has been joined as a petitioner in this proceeding.

I. INTRODUCTION

We have authority to hear this *inter partes* review under 35 U.S.C. § 6, and this Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, Cisco Systems, Inc. and Juniper Networks, Inc. (collectively “Petitioner”) has established by a preponderance of the evidence that claims 1–31 of U.S. Patent No. 7,545,740 B2 (Ex. 1001, “’740 Patent”) are unpatentable.

A. Procedural History

Cisco Systems, Inc. filed a Petition requesting *inter partes* review of claims 1–31 of the ’740 Patent. Paper 2 (“Pet.”). Orckit Corporation (“Patent Owner”) timely filed a Preliminary Response. Paper 7. With our authorization, Petitioner filed a Preliminary Reply (Paper 8) and Patent Owner filed a Preliminary Sur-reply (Paper 9) to address discretion to deny institution. Pursuant to 35 U.S.C. § 314, we instituted trial as to all of the challenged claims and all of the grounds raised in the Petition on September 11, 2023. Paper 10 (“Dec. on Inst.”).

After institution of trial, Patent Owner filed a Response (Paper 21, “PO Resp.”) to which Cisco Systems, Inc. filed a Reply (Paper 27, “Pet. Reply”). Also following institution of trial, Juniper Networks, Inc. filed a Petition requesting *inter partes* review along with a Motion for Joinder. Pursuant to 35 U.S.C. §§ 314, 315(c), we instituted trial and granted the Motion for Joinder. Paper 28. Subsequently, Patent Owner filed a Sur-reply (Paper 32, “PO Sur-reply”).

Petitioner relies on a Declaration of Henry Houh, Ph.D., (Ex. 1003) to support its Petition and a Supplemental Declaration of Henry Houh, Ph.D., (Ex. 1025) to support its Reply. Patent Owner filed a Declaration of Miguel Gomez Ph.D., (Ex. 2024) to support its Response.

Dr. Houh and Mr. Gomez were cross-examined during trial, and a transcript of Dr. Houh’s deposition (Ex. 2026) and a transcript of Mr. Gomez’s deposition (Ex. 1026) are included in the record.

Oral argument was held on June 12, 2024. A transcript of the oral argument is included in the record. Paper 37.

B. Related Matters

The parties identify the following current or former proceedings involving the ’740 Patent:

Orckit Corporation v. Cisco Systems, Inc., 2:22-cv-276 (E.D. Tex.)

Orckit Corporation v. Juniper Networks, Inc., 1:23-cv-00822

(D. Del.)

Orckit Corporation v. Arista Networks, Inc., 1:23-cv-00821 (D. Del.)

Pet. 89; Paper 3, 2; Paper 26, 1.

C. Overview of the ’740 Patent (Ex. 1001)

The ’740 Patent “relates generally to communication networks, and particularly to methods and systems for link aggregation in network elements.” Ex. 1001, 1:5–7. “Link aggregation (LAG) is a technique by which a group of parallel physical links between two endpoints in a data network can be joined together into a single logical link (referred to as the ‘LAG group’).” *Id.* at 1:11–14.

“For Ethernet™ networks, link aggregation is defined by Clause 43 of IEEE Standard 802.3ad, Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications (2002 Edition), which [the ’740 Patent] incorporate[s] . . . by reference.” Ex. 1001, 1:17–21. “Clause 43 defines a link aggregation protocol sub-layer, which interfaces between the standard Media Access Control

(MAC) layer functions of the physical links in a link aggregation group and the MAC clients that transmit and receive traffic over the aggregated links.”

Id. at 1:21–26. “The link aggregation sub-layer comprises a distributor function, which distributes data frames submitted by MAC clients among the physical links in the group, and a collector function, which receives frames over the aggregated links and passes them to the appropriate MAC clients.” *Id.* at 1:26–30.

“[T]wo or more physical user ports are aggregated into a LAG group external to the network element, so as to form an aggregated user port having a higher bandwidth.” *Id.* 2:5–8. “Upstream data frames sent from the user ports to the communication network and downstream data frames sent from the communication network to the user ports are distributed among the parallel physical links, so as to balance the traffic load among the links.” *Id.* at 1:48–52.

A “network element comprises one or more user interface modules (UIMs), each serving one or more user ports” and “[i]n some embodiments, each UIM is connected to the communication network using two or more physical links arranged in parallel.” Ex. 1001, 1:42–45. “[T]he UIMs are coupled to a backplane of the network element and the parallel physical links comprise backplane traces” and “are configured as an Ethernet . . . LAG[] group.” *Id.* at 1:56–60.

Unlike some known network element configurations, in which each user port is fixedly assigned to a specific backplane trace, the load balancing operation . . . of the present invention enables statistical multiplexing of the frames[whereby] there is no direct relationship or connection between user ports and backplane traces.

Id. at 1:66–2:4.

Figure 2 of the '740 Patent is reproduced below.

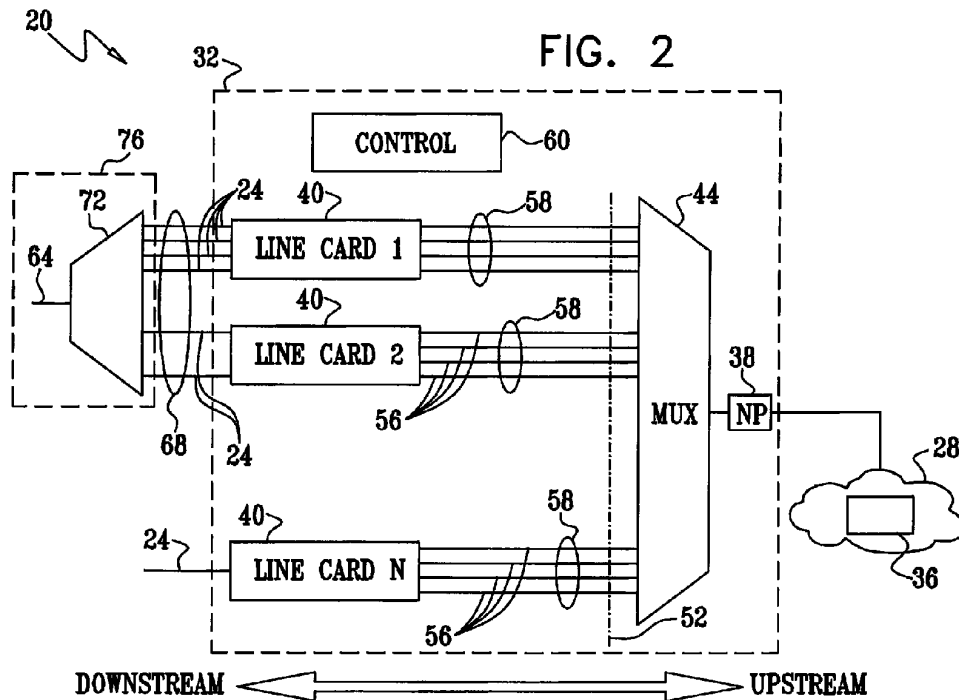


Figure 2 depicts a block diagram of communication system 20 in accordance with an embodiment. *See* Ex. 1001, 3:55–57, 6:15–17. “System 20 interconnects a plurality of user ports 24 to a communication network 28.” *Id.* at 4:5–8. “[S]ystem 20 provides data services to users via network element 32 . . . [and] us[ing] a Layer 2 communication protocol . . . in which data is transferred . . . using Ethernet frames.” *Id.* at 4:19–23. “[N]etwork element 32 . . . connects user ports 24 to a node 36 in network 28 . . . [and] via a network processor (NP) 38.” *Id.* at 4:12–14. “[A] number of user ports 24 are configured to form an aggregated user port 64” because “a particular user requires a bandwidth higher than the bandwidth of a single user port 24.” *Id.* at 6:17–21. “Network element 32 comprises one or more user interface modules (UIMs), such as line cards 40[, where e]ach . . . is assigned to process data frames of one or more user ports.” *Id.* at 4:28–30. “[B]ackplane 52 . . . distributes . . . the frames to and from line

cards 40.” *Id.* at 4:32–33. “Backplane 52 comprises physical links such as backplane traces 56.” *Id.* at 4:34–35.

“A multiplexer (MUX) 44 is coupled to backplane traces 56.”
Ex. 1001, 4:38. “MUX 44 multiplexes upstream frames coming out of line cards 40 to produce an upstream output . . . provided to network processor 38 . . . [and] then sent by network processor 38 via a network connection 48 to network 28.” *Id.* at 4:38–43. “[N]etwork processor 38 . . . accepts . . . downstream frames addressed to user ports 24 from node 36” and “MUX 44 sends each frame to the appropriate user port via the appropriate line-card.” *Id.* at 4:43–48.

“Ethernet frames are statistically multiplexed so as to balance the load among the backplane traces.” *Id.* at 5:19–21. “[T]o achieve load balancing, each group of backplane traces belonging to a particular line card is configured as an Ethernet link aggregation (LAG) group 58” and “considered by the relevant line card and [MUX] 44 to be a single logical link having an aggregated bandwidth (i.e., capacity) equal to the sum of the bandwidths of the individual backplane traces in the group.” *Id.* at 5:10–16. “As a result, there is no pre-assigned relationship or connection between any given user port 24 and a specific backplane trace 56.” *Id.* at 5:17–19. “Ethernet frames are mapped to individual backplane traces in the LAG group in accordance with a . . . mapping function [that] distributes the frames . . . so as to balance the load between the traces.” *Id.* at 5:22–26.

“User ports 24 forming port 64 are configured as an Ethernet LAG group[constituting] an external LAG group 68.” *Id.* at 6:21–23. “Thus, the bandwidth of port 64 is generally equal to the sum of bandwidths of the individual user ports 24 in external LAG group 68[and] in both upstream and downstream directions.” *Id.* at 6:23–26. “[A] particular line card 40

may have some of its user ports 24 assigned to an external LAG group and other user ports 24 used individually or assigned to another external LAG group.” *Id.* at 6:29–31.

Figure 3 of the '740 Patent is reproduced below.

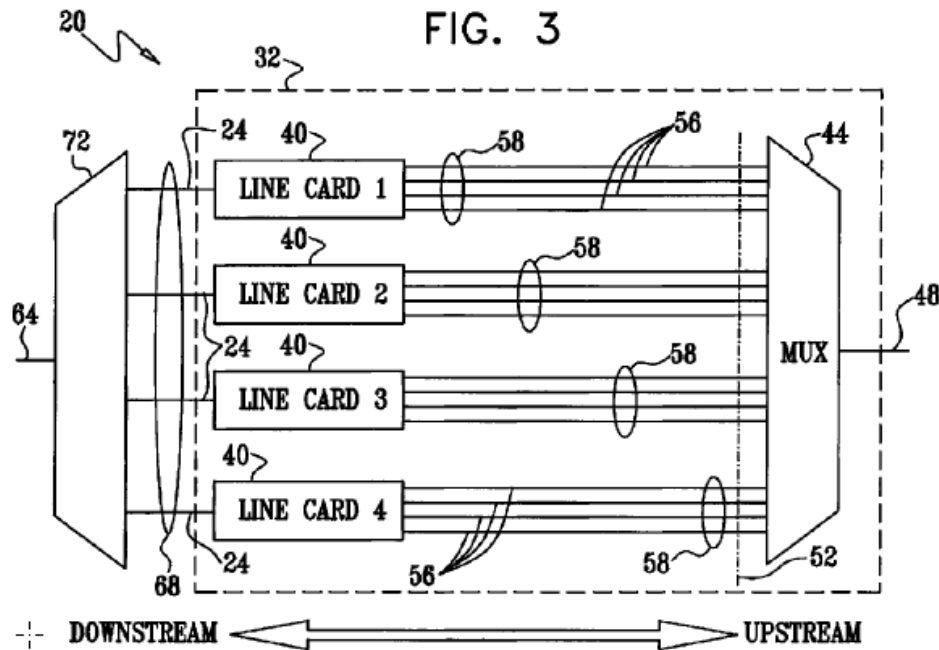


Figure 3 depicts a block diagram of communication system 20 in accordance with an embodiment. *See* Ex. 1001, 3:58–60, 7:4–6. “[N]etwork element 32 . . . comprises four line cards 40.” Ex. 1001, 7:10–11. “Each line card 40 is connected to MUX 44 using four backplane traces 56” and “serves a single user port.” Ex. 1001, 7:11–14. “The four user ports are configured as an external LAG group to form aggregated user port 64.” Ex. 1001, 7:14–16.

D. Illustrative Claim

Claims 1, 4, 5, 13–15, 17, 19, 20, and 28–30 are independent, and remaining claims 2, 3, 6–12, 16, 18, 21–27, and 31 depend directly or indirectly therefrom, respectively. *See* Ex. 1001, 10:64–16:35. Claim 1 is illustrative and reproduced below:

1. A method for communication, comprising:
 - coupling a network node to one or more interface modules
 - using a first group of first physical links arranged in parallel
 - at least one of said first physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
 - coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel, at least one of said second physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
 - receiving a data frame having frame attributes sent between the communication network and the network node;
 - selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group; and
 - sending the data frame over the selected first and second physical links,
 - said sending comprising communicating along at least one of said bi-directional links.

Ex. 1001, 10:65–11:20.

E. Asserted Patentability Challenges and Asserted Prior Art

Petitioner asserts that claims 1–31 are unpatentable on the following grounds and prior art (Pet. 21):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–31	103(a) ²	Bruckman ³
1–31	103(a)	Bruckman, Basso ⁴
11, 26	103(a)	Bruckman, Holdsworth ⁵
11, 26	103(a)	Bruckman, Basso, Holdsworth

II. ANALYSIS

A. Claim Construction

In an *inter partes* review proceeding, the Board applies the same claim construction standard as that applied in federal courts in a civil action under 35 U.S.C. § 282(b), which is generally referred to as the *Phillips* standard. *See* 37 C.F.R. § 42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). Under the *Phillips* standard, “words of a claim ‘are generally given their ordinary and customary meaning.’” *Phillips*, 415 F.3d at 1312.

“Interface Module”

Petitioner asserts “[t]he ’740 patent explicitly contemplates that a line card is within the scope of the term *interface module*.” Pet. 19 (citing Ex. 1001, 4:28–29). According to Petitioner, “[a] line card is thus an interface module as claimed.” *Id.* (citing Ex. 1003 ¶ 33). Patent Owner does

² The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. § 103 effective March 16, 2013. Because the ’740 Patent claims an effective filing date prior to March 16, 2013, we refer to the pre-AIA version of § 103.

³ US 2004/022827 A1, published Nov. 18, 2004 (Ex. 1005).

⁴ US 2003/021068 A1, published Nov. 13, 2003 (Ex. 1006).

⁵ Holdsworth et al., *Digital Logic Design*, Elsevier Science, 2002 (ISBN 0 7506 45882) (Ex. 1007).

not address or otherwise address the scope of the term “interface module.”
See PO Resp. *generally*.

As demonstrated in the analysis below, we need not construe “interface module.” *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

“selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group”

Petitioner contends that “single computation” in the claim phrase “selecting, in a single computation” “does not refer to performing the *selecting* process in a single step, but rather to a single computational result of a hashing function (e.g., single value) that *selects* the outcome.” Pet. 19–20 (citing Ex. 1001, 5:29–31). Petitioner asserts that the ’740 Patent and claims 8–10 describe a multi-step selecting process in Figure 4 that includes determining a hash size, calculating a hash key, and determining a mapping step. *See* Pet. 19 (citing Ex. 1001, claims 8–10, Fig. 4). According to Petitioner, “the single value, or the final processing step that produces that single value, are examples of a ‘*single computation*.’” Pet. 20 (citing Ex. 1001, 5:29–31; Ex. 1003 ¶¶ 34–36).

Patent Owner does not dispute Petitioner’s assertions addressing “a single computation.” *See* PO Resp. 21–32; *see also id.* at 28–30 (arguing that the ’740 Patent discloses performing both selections in a single computation because selecting two links adds complexity). Both parties generally agree that the claims require two selections – one from a first

group of links and the second from a second group of links. *See id.* at 21–24, 28–30; Pet. Reply 11; PO Sur-reply 3.

Concerning these two selections, Patent Owner, however, asserts that the '740 Patent Specification “disavows any configurations where ***the user port is fixedly assigned to a specific backplane trace.***” PO Resp. 23 (citing *Thorner v. Sony Computer Entertainment Am. LLC*, 669 F.3d 1362, 1366 (Fed. Cir. 2012)), *see id.* at 25 (similar argument). According to Patent Owner,

the summary of the invention states that a distinguishing characteristic of the claimed invention is that, unlike the prior art where ‘each user port is fixedly assigned to a specific backplane trace,’ the ports in the '740 Patent (i.e., an embodiment of the first links) are not directly assigned to any particular backplane trace (i.e., an embodiment of the second links).

PO Resp. 25 (citing Ex. 1001, 1:66–2:4), *see id.* at 37–38 (similar argument, citing Ex. 1001, 1:66–2:4); PO Sur-reply 3 (similar argument, citing Ex. 1001, 1:66–2:4).

Patent Owner asserts that the '740 Patent Specification “teaches that the claimed embodiments support various different forms of load balancing . . . as a result of which ‘there is no pre-assigned relationship or connection between any given user port 24 and a specific backplane trace, as in some conventional network elements.’” PO Resp. 25–26 (citing Ex. 1001, 5:9–10, 5:17–19); *see id.* at 37–38 (similar argument, citing Ex. 1001, 5:13–21); PO Sur-reply 3 (similar argument, citing Ex. 1001, 5:13–21). Patent Owner asserts that dependent claim 7 expressly requires balancing a frame data rate among at least some of the first and second links. *See* PO Resp. 26. According to Patent Owner,

[p]erforming such load balancing (i.e., between different permutations of ports and traces) consistent with the claims and specification requires a network element in which each of the ports is assigned to more than one backplane traces, such that the selection of a port does not also determine the exact trace over which data will be transmitted.

Id.

Patent Owner further asserts that the '740 Patent Specification “describes a control module that performs two selections of links in the claimed network element—e.g., of ports and traces—and consists of line cards that serve ports and traces with no direct relationship.” *Id.* at 26–27 (citing Ex. 1001, 5:59–6:14). According to Patent Owner,

the control module disclosed in the patents (and claimed in certain of the independent claims) performs two discrete selections: one of a port (i.e., a first link) and one of a backplane trace (i.e., a second link). To permit these two discrete selections, the ports (e.g., the input lines to the interface module in the upstream direction) must not have a predetermined relationship with the backplane traces (e.g., the output lines coming out of the interface module in the upstream direction).

Id. at 27. Patent Owner further contends that “in the downstream direction, the [‘740 P]atent discloses ‘two mapping operations’ that can be performed in [] ‘a single combined mapping operation.” *Id.* (citing Ex. 1001, 6:60–65). According to Patent Owner, “[a] first mapping operation determines the port and line card and the second mapping operation determines the particular trace through which the frame will be transmitted.” *Id.* at 27–28 (citing Ex. 1001, 6:51–65). According to Patent Owner,

[a] POSITA would understand this disclosure, consistent with the express language of element 1.6 (which requires ‘selecting a first physical link out of the first group and a second physical link out of the second group’), to require the selection of two

links (e.g., a port and a backplane trace) that are discrete from one another (e.g., where selection of a port does not dictate the specific trace).

Id. at 28 (citing Ex. 2024 ¶¶ 70–71).

Patent Owner contends that each of the figures in the '740 Patent depicts line cards in which the ports 24 correspond to several traces 56. *See* PO Resp. 30–32 (reproducing Ex. 1001, Figs. 1–3, 5). Patent Owner contends that there is no embodiment in which the ports correspond to only a single backplane trace 56. *See id.* at 32. According to Patent Owner, “a POSITA would understand from these figures that in every instance the backplane trace is not determined by the selection of a port.” *Id.*

Patent Owner contends that “[t]hese intrinsic statements both independently and ‘collectively [] amount [] to a disavowal’ of prior art configurations where each port is fixedly assigned to a specific backplane trace.” PO Resp. 32. According to Patent Owner,

[a] POSITA would understand from the claim language, the specification, and the figures in the '740 Patent that the ‘selection’ limitation requires that the selection of the second physical link from the second group is not determined by the selection of the first physical link from the first group such that the first physical link is not fixedly assigned to the second physical link.

Id. at 32.

In the Reply, Petitioner contends the Board should reject Patent Owner’s invitation to add a new feature to the claims in the form of a negative limitation. *See* Pet. Reply 9. Petitioner asserts that neither the claim language nor the specification justify reading a new negative limitation into the selecting step. *See id.* (citing *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1340 (Fed. Cir. 2001)).

Petitioner asserts that there is no statement of manifest exclusion or restriction and no clear statement showing unmistakable and unambiguous evidence of disclaimer. *See* Pet. Reply 11–12 (citing *Thorner v.*, 669 F.3d at 1366), 13 (citing *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1325 (Fed. Cir. 2003)). According to Petitioner,

Nowhere does the specification clearly limit the scope of the claims to implementations where there is more than one backplane trace associated with a particular link. At most, the specification explains that the claimed invention is beneficial in such implementations, because it “**enables statistical multiplexing** of the frames, in which there is no direct relationship or connection between user ports and backplane traces.” But enabling statistical multiplexing in some embodiments does not justify requiring such a feature where the claims do not recite it.

Pet. Reply 13 (citing Ex. 1001, 1:66–2:4); *see id.* at 12.

Petitioner further asserts that Patent Owner’s expert Mr. Gomez’s testimony that the negative limitation against fixed link assignments is an inherent component of the claim language is incorrect and untenable. *See* Pet. Reply 10 (citing Ex. 1026, 43). Petitioner points out that the claims recite bi-directional communication, and the ’740 Patent provides examples where in the downstream direction multiple links are fixedly assigned to one link. *See id.* In support of its argument, Petitioner directs attention to Figure 1 which shows Line Card N with just one user port 24 and multiple backplane traces 56 that are fixedly assigned to line card N’s single user port. *See id.* at 10–11 (reproducing Ex. 1001, Fig. 1 (with Petitioner’s annotations added)). According to Petitioner, “[f]or downstream communications to pass through Line Card N, however, the single user port 24 on Line Card N would still be ‘selected’ to carry the communications

since selecting any other user port would result in a broken (incomplete) communication path.” *Id.* at 10.

Petitioner further disputes Patent Owner’s assertion that each of the Figures in the ’740 Patent depict line cards in which the ports correspond to several traces. *See* Pet. Reply 12. According to Petitioner, Patent Owner fails to address “Figure 3, which in the downstream direction shows that each line card 40 (and its corresponding backplane traces 56) corresponds to only a single port 24.” *Id.* Petitioner asserts that “each backplane trace 56 in Figure 3 has a ‘pre-assigned relationship or connection’ to a single port 24.” *Id.* (citing PO Resp. 26). Petitioner contends that Patent Owner’s construction would exclude the Figure 3 embodiment. *See id.* at 12–13.

In the Sur-reply, Patent Owner asserts that “[d]isavowal ‘need not be explicit’ and can be effected, for example ‘when the specification distinguishes or disparages prior art based on the absence of a feature.’” PO Sur-reply 3 (citing *Poly-America, L.P. v. API Industries, Inc.*, 839 F.3d 1131, 1136 (Fed. Cir. 2016)). According to Patent Owner, “[t]he ’740 Patent disparages as ‘conventional prior art elements in which each port is ‘fixedly assigned’ to a specific trace and touts the claimed devices for **lacking** a ‘pre-assigned relationship between any given user port 24 and a specific backplane trace 56.’” *Id.* at 3–4; *see id.* at 8 (similar argument).

Patent Owner further asserts that Petitioner incorrectly contends that Figs. 1 and 3 show configurations “where in the downstream direction multiple links are indeed ‘fixedly assigned’ to one link.” PO Sur-reply 4 (citing Pet. Reply 10–11). According to Patent Owner, “in both Figs. 1 and 3, each port 24 corresponds to several traces 56, such that no port ‘is fixedly assigned’ to a specific trace and selecting a port does not determine

the corresponding trace.” *Id.* at 4–5 (reproducing Ex. 1001, Figs. 1, 3 (with Patent Owner’s annotations added)). Patent Owner further contends that Petitioner misreads the ’740 Patent because it does not require that each trace must correspond to several ports, only that each port must not correspond to a specific trace. *See id.* at 4 n.2 (citing Ex. 1001, 1:66–2:4, 5:13–21). According to Patent Owner, consistent with the proposed construction, “and contrary to Petitioner’s assertions, every disclosed embodiment features a ‘first physical link [that] is not fixedly assigned to the second physical link.’” *Id.* at 7.

We do not agree with Patent Owner’s arguments that the ’740 Patent Specification disavows “any configurations where the user port is fixedly assigned to a specific backplane trace” from the full scope of the claim. Patent Owner’s citations to disclosures in the ’740 Patent Specification do not disparage the prior art, but merely contrast the configurations of the user ports and backplane traces disclosed in the ’740 Patent to “some known network element configurations” and “some conventional network elements.” *See* Ex. 1001, 1:66–2:4, 5:13–21. We find that the comparison of the disclosed configurations of user ports and backplane traces to that of the prior art in the ’740 Patent Specification does not constitute a clear disavowal of the first physical link fixedly assigned to the second physical link. *See Continental Circuits LLC v. Intel Corp.*, 915 F.3d 788, 798 (Fed. Cir. 2019) (“[C]omparing and contrasting the present technique to that of the prior art does not ‘rise to the level of a clear disavowal’ of claim scope.”).

Accordingly, we decline to construe “selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group” as requiring “the first physical link is not fixedly assigned to the second

physical link,” as proposed by Patent Owner. PO Resp. 23. We give the words of the claim their ordinary and customary meanings.

“a second group of second physical links arranged in parallel”

Claim 1 recites “coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel.” Ex. 1001, 11:4–6 (Petitioner labels this limitation as “1.3”). Patent Owner asserts that the prior art discloses traces coupled to different endpoints, and thus they are not “arranged in parallel” as required by the claims. *See* PO Resp. 35–36.

Patent Owner points to “relevant endpoints,” a “common relevant endpoint,” and “second relevant endpoint” when addressing the prior art. *See id.* at 37 (citing Ex. 2024 ¶¶ 82–84). According to Patent Owner,

[i]n the context of the ’740 patent, the relevant endpoints are those which would enable a principal innovation in the network element architecture disclosed in the ’740 patent, in particular, the lack of a pre-assigned relationship between (i) the second links that connect the network to the interface module and (ii) the first links that connect the interface module to a user.

Id. at 37–39 (citing Ex. 2024 ¶ 85; Ex. 1001, 1:66–2:4, 5:13–21, 6:7–10).

Patent Owner asserts that “the first and second physical links must terminate at endpoints—e.g., interface modules—that permit the first physical links to connect directly to more than one second physical links.” *Id.* at 39. Patent Owner asserts that the “understanding of ‘arranged in parallel’ and the lack of a fixed relationship between first and second physical links is consistent with every embodiment depicted in the figures of the ’740 patent.” *Id.* at 39–40 (reproducing Ex. 1001, Fig. 2). More specifically, Patent Owner contends

a POSITA would understand, e.g., from Fig. 2 . . . , that as to each line card (e.g., line card 1), the backplane traces 56 are arranged in parallel because (i) they are depicted as parallel physical connections and, critically, (ii) they have the same relevant endpoints: MUX 44 and line card 1.

PO Resp. 40 (citing Ex. 2024 ¶ 87); *see* PO Sur-reply 9 (similar argument, reproducing Ex. 1001, Fig 2 (with Patent Owner’s added annotations); citing Ex. 2024 ¶¶ 86–88), 12 (“links 56 share the same endpoints, *i.e.*, MUX 44 and UIMs 40”). Patent Owner asserts that Petitioner’s expert, Dr. Houh

testified to this very point, *i.e.*, that a POSITA would understand the ’740 Patent’s backplane traces to be parallel because they are shown as such in the drawing **and** because they have the **same** relevant start and endpoints (*i.e.*, the same multiplexer, and the same sets of ports, via the same line cards).

PO Resp. 41–42 (citing Ex. 2026, 61:14–62:14). Patent Owner further contends

[a] POSITA would understand that providing the backplane traces 56 as parallel physical links—*i.e.*, with endpoints defined as (a) the specific component (line card) that connects those traces to a group of ports 24; and (b) the same multiplexer 44—enables a network element “in which there is no direct relationship or connection between user ports and backplane traces.”

Id. at 42 (citing Ex. 2024 ¶ 89).

In the Reply, Petitioner asserts that Patent Owner’s implicit construction for “arranged in parallel” is not supported by the intrinsic or extrinsic evidence of record and contradicts the ’740 Patent Specification. *See* Pet. Reply 14 –15 (reproducing Ex. 1001, Fig. 2 (with Petitioner’s annotations added), citing Ex. 1001, 1:10–14, 6:27–28). Petitioner asserts that no construction is required. *See id.* at 15. In any event, Petitioner offers an alternative claim construction should the Board determine that a

construction is necessary. *See id.* at 15–16. Petitioner proposes that, in the alternative, it should be construed to include what is described in the ’740 patent: lines that transfer data between a user node and a communication network are in ‘parallel.’” *Id.* at 15; *see id.* at 15–16 (citing Ex. 1001, 1:41–47, Fig. 2).

For the purpose of resolving the controversy before us, we need not construe the phrase “arranged in parallel.” We do not agree with either of the proposed constructions for that seek to define “arranged in parallel” in relation to “relevant endpoints,” “a common relevant endpoint,” “a second relevant endpoint,” or “between a user node and a communication network.” Claim 1 already includes a description of endpoints for the second group of second physical links arranged in parallel: “each of the one or more interface modules” and “a communication network” because claim 1 recites “coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel.” Ex. 1001, 11:4–6. Independent claims 4, 5, 13, 17, 19, 20, and 28 each recite identical or similar limitations. *See* Ex. 1001, 11:28–15:28.

Other Claim Terms and Phrases

As demonstrated in the analysis below, we need not construe any other claim terms or phrases. *See Realtime Data*, 912 F.3d at 1375.

B. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art (“(POSITA)”) in April 2006 would have had a working knowledge of computer networking, including such commonly used technologies as Ethernet and the internet protocol / transmission control protocol (TCP/IP) suite.” Pet. 18 (citing Ex. 1003 ¶¶ 7–9). Petitioner further asserts that “[a] POSITA would

have had a bachelor's degree in electrical engineering, or an equivalent, and two years of professional experience in the field of communication networks, including link aggregation in communication networks.” *Id.* (citing Ex. 1003 ¶¶ 7–9). “For purposes of this Patent Owner Response, Patent Owner does not dispute Petitioner’s level of ordinary skill.” PO Resp. 21.

We adopt Petitioner’s definition of a person of ordinary skill in the art because it is supported by declaration testimony and is consistent with the level of skill reflected by the ’740 Patent Specification and the asserted prior art.

C. Principles of Law

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 the invention was made to a person having ordinary skill in the art to which the subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) if in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).⁶

⁶ The parties do not present evidence or arguments regarding secondary considerations.

D. Patentability Challenge Based on Bruckman

1. Overview of Bruckman (Ex. 1005)

Bruckman is directed to “link aggregation in a data communication network,” and more specifically, “bandwidth allocation in a link aggregation system to ensure that sufficient bandwidth will be available on the links in the group in order to meet service guarantees, notwithstanding load fluctuations and link failures.” Ex. 1005 ¶¶ 1, 15.

Figure 1 of Bruckman is reproduced below.

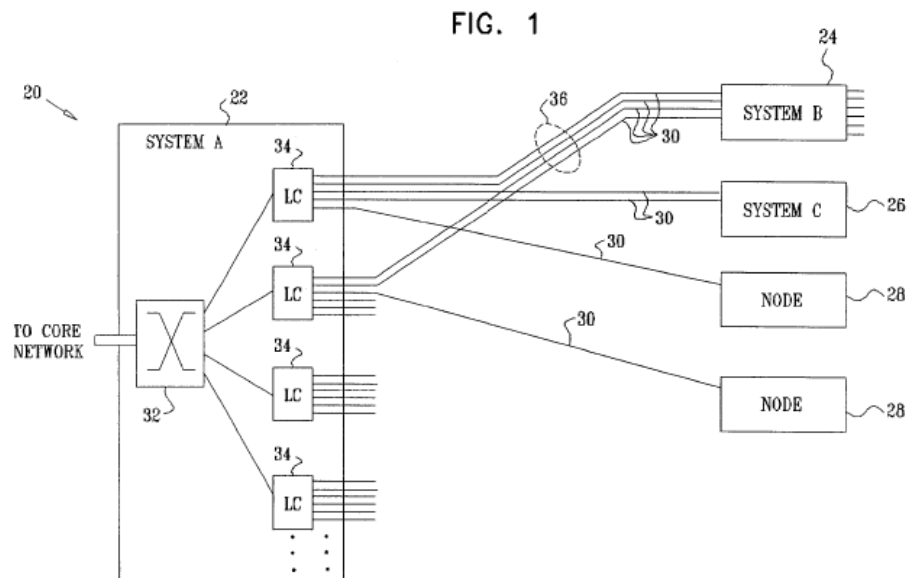


Figure 1 depicts a block diagram illustrating network communication system 20 with link aggregation. Ex. 1005 ¶¶ 44, 47. System 20 includes central office equipment 22 that is configured to convey packet data traffic and communicate with customer nodes 24, 26, 28 over full duplex Ethernet links 30. *See id.* ¶ 47. Equipment 22 comprises main switching card 32 connected to multiple line cards 34 serving links 30. *See id.* “Equipment 22 and certain nodes 24 and 26, are configured to serve as aggregation systems in accordance with . . . Clause 43 of the 802.3 standard.” *Id.* ¶ 48. “[A]n aggregation group 36 of four physical links is defined between equipment 22

and node 24.” *Id.* “Another aggregation group of two physical links may be defined between equipment 22 and node 26.” *Id.*

Figure 2 of Bruckman is reproduced below.

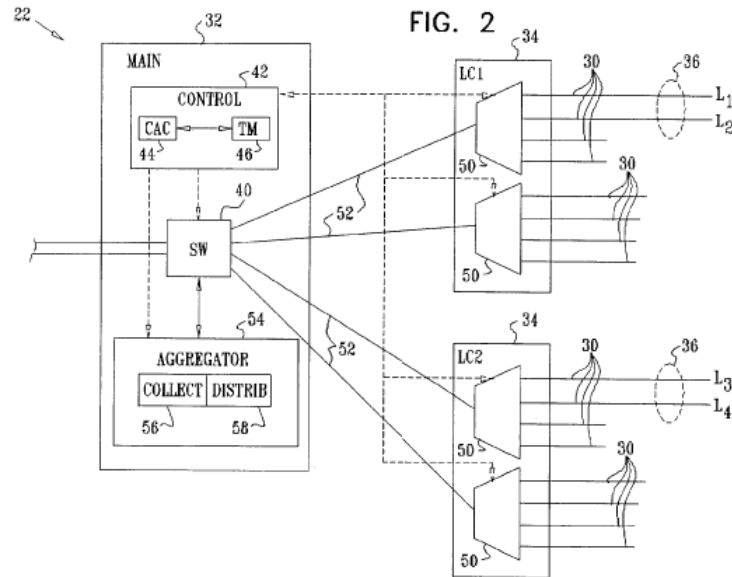


Figure 2 depicts a block diagram detailing equipment 22. *See* Ex. 1005 ¶ 48. Equipment 22 comprises main card 32 which comprises switching core 40 that switched traffic to and from two line cards 34 (LC1 and LC2). *See id.* ¶ 49. Controller 42 manages switch 40. *See id.* Connection Admission Control entity (CAC) 44 is a software process running on controller 42 that manages the allocation of bandwidth in equipment 22 to ensure all connections between equipment 22 and customer nodes 24, 26, 28 receive the amount of guaranteed bandwidth to which they are entitled, and allocate excess bandwidth. *See id.* ¶ 50. Traffic manager (TM) 46 is a software process running on controller 42 that receives information regarding the operational status of links 30. *See id.* ¶ 56. Aggregator 54 is a software process running on controller 42 that controls the link aggregation functions performed by equipment 22. *See id.* ¶ 57.

“Each line card 34 comprises one or more concentrators 50, which comprise multiple ports that serve respective links 30.” Ex. 1005 ¶ 56. Concentrators 50 “multiplex data traffic between links 30 and traces 52, which connect the concentrators to switching core 40.” *Id.* “[M]ain card 32 and line cards 34 are arranged in a card rack and plug into a printed circuit back plane . . . which comprises traces 52.” *Id.* “To prevent overloading of traces 52, concentrators 50 may limit the rate of incoming data admitted on each link 30 so that it remains between a predetermined minimum . . . and a maximum.” *Id.*

Aggregator 54 further comprises collector 56, which collects data frames that were received over different links 30 in group 36, and arranges the frames back into a single traffic stream. *See* Ex. 1005 ¶ 65.

Aggregator 54 also comprises a distributor 58, which distributes data frames arriving from the network among links 30 in aggregation group 36 and determines the link over which to send each frame by applying a predetermined hash function to the header information. *See id.* ¶ 58.

[T]he hash function satisfies the following criteria: [(1)t]he hash value output by the function is fully determined by the data being hashed, [such] that frames with the same header will always be distributed to the same link[; (2) t]he hash function uses all the specified input data from the frame headers[; (3) t]he hash function distributes traffic in an approximately uniform manner across the entire set of possible hash values[; and (4) t]he hash function generates very different hash values for similar data.

Id. ¶¶ 58–62.

Table 1 of Bruckman is reproduced below.

TABLE I	
DISTRIBUTOR HASH FUNCTION	
<pre>unsigned short hash(unsigned char *hdr, short lagSize) { short i; unsigned short hash=178; // initialization value for (i=0; i<4; i++) // hdr is 4 bytes length hash = (hash<<2) + hash + (*hdr>>(i*8) & 0xFF); return (hash % lagSize) }</pre>	

Table 1 shows an example hash function. *See* Ex. 1005 ¶ 63. In Table 1, “hdr is the header of the frame to be distributed,” and “lagsize is the number of active ports (available links 30) in link aggregation group 46.” *Id.* ¶ 64.

“Normal data transmission . . . continues unless and until a failure is detected on one of links 30 or line cards 34.” *Id.* ¶ 74. If a failure occurs, traffic manager 46 is informed of the failure, and notifies distributor 58 to modify its hash function so that outgoing traffic is distributed over the remaining links in the group. *See id.*

2. Analysis of Claim 1

a. Preamble—[1.0] A method for communication, comprising:

Petitioner asserts that Bruckman teaches the preamble recitation based on Bruckman’s disclosure of methods and systems of link aggregation in a data communication network. *See* Pet. 34 (citing Ex. 1005 ¶ 1, code (57)).

Patent Owner does not address or rebut Petitioner’s showing for the preamble. *See* PO Resp. 33–62. Nonetheless, the burden remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

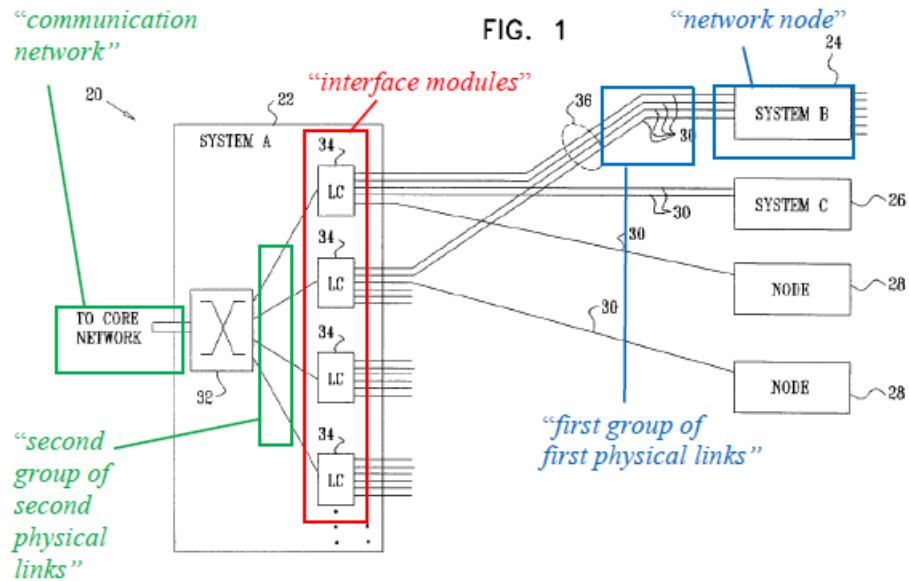
Based on the entire record, we determine Petitioner shows that Bruckman teaches the preamble recitation. *See* Pet. 34.

b. [1.1] coupling a network node to one or more interface modules using a first group of first physical links arranged in parallel, . . .

[1.3] coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel,

Petitioner asserts that Bruckman's disclosure of networked customer nodes 24, 26, 28 connected to line cards 34 over links 30 teaches "coupling a network node to one or more interface modules using a first group of first physical links arranged in parallel." *See* Pet. 34–35 (reproducing Ex. 1005, Fig. 1 (with Petitioner's added annotations); citing Ex. 1003 ¶¶ 60, 62; Ex. 1005 ¶¶ 2, 47); Pet. Reply 16–17 reproducing Ex. 1005, Fig. 1 (with Petitioner's added annotations)). Petitioner also contends that Bruckman's disclosure of line cards 34 coupled to core network with a set of parallel traces 52 teaches "coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel." *See* Pet. 36–39 (reproducing Ex. 1005, Figs. 1, 2 (with Petitioner's added annotations); citing Ex. 1003 ¶¶ 67–70; Ex. 1005 ¶¶ 2, 56–57, 66); Pet. Reply 16–17 (reproducing Ex. 1005, Fig. 1 (with Petitioner's added annotations)).

Petitioner's annotated Figure 1 of Bruckman is reproduced below.



Ex.1005, Fig. 1 (annotated); Ex.1003, ¶69.

Petitioner’s annotated Figure 1 of Bruckman depicts a block diagram illustrating network communication system 20 with Petitioner’s annotations labeling the “network node” “first group of first physical links,” “interface modules,” “second group of second physical links,” and “communication network.” See Pet. 39

More particularly, Petitioner contends that “[i]n Bruckman’s system, the line cards 34 (*one or more interface modules*) are coupled to the core network (*communication network*) with a set of parallel traces 52 (*a second group of second physical links arranged in parallel*). Pet. 37. According to Petitioner, Figure 2 “provides more details of the communication system 20 shown in Fig. 1,” and shows that “[e]ach line card 34 comprises one or more concentrators 50 which comprise multiple ports that serve multiple links. The concentrators multiplex data traffic between links 30 and traces 52, which connect the concentrators to switching core 40.” *Id.* at 24, 37 (reproducing Ex. 1005, Fig. 2 (with Petitioner’s added annotations); quoting Ex. 1005 ¶ 56). Petitioner contends

that “by connecting the line cards 24 to the switching core 40 of the main card 32, the traces connect the line cards 34 to a ‘communication network.’” Pet. 38; *see* Pet. 39 (reproducing Ex. 1005, Fig. 2 (with Petitioner’s added annotations)).

Petitioner asserts that each of the traces 52 are arranged in parallel in Fig. 2. *See* Pet. 37–38. Petitioner contends that, because Bruckman discloses “[t]races 52 are part of a link aggregation group, Bruckman further renders obvious that the traces are a group of parallel physical links.” Pet. 38 (citing Ex. 1005 ¶¶ 2, 57, 66); *see* Pet. Reply 22 (citing Pet. 38). Similarly, Petitioner contends that “each of Bruckman’s two line cards 34 (‘interface modules’) includes at least two traces 52 that connect that line card to the communication network.” Pet. 67–68 (reproducing Ex. 1005, Fig. 2 (with Petitioner’s added annotations); citing Ex. 1003 ¶¶ 160–162).

Patent Owner asserts that Bruckman does not disclose or render obvious “coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel” because the traces 52 in Bruckman’s apparatus are not arranged in parallel. *See* PO Resp. 36. Patent Owner contends that each of the traces 52 is coupled to different endpoints, a switching core 40 on the left and one of several concentrators 50 on the right. *See id.* at 36–37 (reproducing Ex. 1005, Fig. 2 (with Patent Owner’s annotations added)); *see* Pet. Reply 20. According to Patent Owner,

a POSITA would understand that this arrangement of traces 52 in Bruckman is not an arrangement in parallel, as required by limitation 1.3, because: (i) the relevant endpoints for the traces 52 in the context of the internal layout of the Bruckman apparatus are the switching core 40 and each of the concentrators 50, and (ii) the traces share only one common relevant endpoint (the switching core 40), while the second

relevant endpoint (*i.e.*, each of the concentrators) is different for each trace.

PO Resp. 37 (citing Ex. 2024 ¶¶ 82–84); *see id.* (citing Ex. 2024 ¶ 81). Patent Owner contends that “Bruckman discloses a network element in which the traces 52 are (i) not drawn in parallel and (ii) all connect to different concentrators 50, each of which is associated with different sets of physical links 30.” *Id.* at 42; *see id.* at 43 (reproducing Ex. 1005, Fig. 2 (with Petitioner’s annotations added)), 46 (similar argument, citing Ex. 2024 ¶ 92). According to Patent Owner, “[a] POSITA “would recognize that Bruckman’s traces 52 are going to different places. And as Dr. Houh testified, traces ‘going to *different* places’ would not be understood by a POSITA as parallel.” *Id.* at 43–44 (citing Ex. 2026, 62:15–63:6); *see* Pet. Reply 19, 20.

We do not agree with Patent Owner’s arguments. Patent Owner characterizes the “relevant endpoints” in Bruckman as switching core 40 and concentrators 50. As explained above in Section II.A, limitation 1.3 describes the endpoints as “each of the one or more interface modules” and “a communication network.” Consistent with Petitioner’s position, we find that Bruckman discloses coupling each line card 34 (e.g., LC1 or LC2) to switching core 40 using a group of traces 52 (e.g., two) arranged in parallel between either LC1 or LC2 and switching core 40. *See* Pet. 36–39, 67–68.

Having considered both parties’ arguments and the evidence cited by the parties to support their respective arguments, we are persuaded that the Bruckman teaches or suggests “coupling a network node to one or more interface modules using a first group of first physical links arranged in parallel,” and “coupling each of the one or more interface modules to a communication network using a second group of second physical links

arranged in parallel.” Based on the entire record, we determine Petitioner shows that Bruckman teaches these limitations of claim 1. *See* Pet. 34–39, 67–68.

c. [1.2] at least one of said first physical links being a bi-directional link to communicate in both an upstream direction and a downstream direction;
[1.4] at least one of said second physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;

Petitioner asserts that Bruckman’s disclosure of equipment 22 that includes aggregator 54 that uses distributor 58 for distributing data frames arriving from the network among physical links 30 and that uses collector 56 for collecting data frames that were received over links 30 teaches “***at least one of said first physical links being a bi-directional link to communicate in both an upstream direction and a downstream direction.***” *See* Pet. 35–36 (citing Ex. 1003 ¶¶ 63–66; Ex. 1005 ¶¶ 47, 58, 65; Ex. 1009, 376; Ex. 1021, 8:11–13). Petitioner contends that Bruckman’s disclosure of aggregator 54 that “distributes traffic not only to full-duplex links 30 . . . , ‘but also **to traces 52 that connect to multiplexers 50** that serve these links’” teaches “at least one of said second physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction.” *See* Pet. 39–40 (citing Ex. 1005 ¶ 57; Pet. 35–36). According to Petitioner, “[s]ince aggregator [54] includes both a traffic ‘distributor’ and a traffic ‘collector,’ it would have been obvious that traffic flows in both directions over traces 52.” Pet. 40 (citing Ex. 1003 ¶ 71; Ex. 1005 ¶¶ 58, 65).

Patent Owner does not address or rebut Petitioner’s showing for these limitations. *See* PO Resp. 33–62. Nonetheless, the burden remains on

Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

Based on the entire record, we determine Petitioner shows that Bruckman teaches these limitations of claim 1. *See* Pet. 35–36, 39–40.

d. [1.5] receiving a data frame having frame attributes sent between the communication network and the network node;

Petitioner contends that Bruckman teaches this limitation based on Bruckman’s disclosure of main card 34 that includes aggregator 54 that receives data frames sent between core network and links 30 connected to customers, where the data frames include various attributes including frame headers. *See* Pet. 40–41 (citing Ex. 1003 ¶¶ 73–74; Ex. 1005 ¶ 58).

Petitioner directs attention to Bruckman’s disclosure that “[t]ypically distributor 58 determines the link over which to send each frame based on information in the **frame header**.” Pet. 40 (citing Ex. 1005 ¶ 58).

Patent Owner does not address or rebut Petitioner’s showing for this limitation. *See* PO Resp. 33–62. In any event, the burden remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

Based on the entire record, we determine Petitioner shows that Bruckman teaches this limitation of claim 1. *See* Pet. 40–41.

e. [1.6] selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group; and

Petitioner asserts that the teachings of Bruckman render obvious this limitation. Pet. 41–45. More specifically, Petitioner contends that Bruckman discloses aggregator 54 that includes distributor 58 that applies a predetermined hash function to the header information that selects which

link 30 will transmit the data frame from the core network to the customer based on the value calculated from the “hash % lagSize” operation. *See* Pet. 41–42 (reproducing Ex. 1005, Table 1 (with Petitioner’s added annotations); citing Ex. 1003 ¶ 77; Ex. 1005 ¶ 58; Ex. 1011, 85, Ex. 1020, 7:44–45). Petitioner asserts that “hash % lagSize” itself, or its result, render obvious the claimed “single computation.” *See* Pet. 42; Ex. 1003 ¶ 77.

According to Petitioner, “a POSITA would have found it obvious that Bruckman’s hashing function selects both which link 30 (*‘first physical link out of the first group’*) **and** which trace 52 (*‘second physical link out of the second group’*) will transmit the data frame from the core network to the customer node.” Pet. 42 (citing Ex. 1003 ¶ 78); *see* Pet. Reply 20 (citing Pet. 42–44). Petitioner asserts that “Bruckman explicitly states that the hash function determines which link 30 receives the data frame.” Pet. 42 (citing Ex. 1005 ¶ 58). Petitioner acknowledges that “Bruckman provides limited description of how the hash computation is used to select a trace,” and asserts that “[a] POSITA would have recognized, however, that Bruckman’s selection of a link 30 also determines which trace 52 will transmit the data frame.” Pet. 42–43 (citing Ex. 1003 ¶ 79); *see* Pet. Reply 20 (citing Pet. 42–44). Petitioner provides an example to explain that if a specific link 30, labeled by Petitioner as Link A in Bruckman’s Figure 2, is selected by the hash function, then a specific trace 52, labeled by Petitioner as Trace A in Bruckman’s Figure 2, is also selected. *See* Pet. 43 (reproducing Ex. 1005, Fig. 2 (with added annotations)); *see also id.* (providing a similar example with labels for exemplary Link B and Trace B). According to Petitioner, “[a] POSITA would have found it obvious that selection of a link 30 also determines which trace 52 will transmit the data frame because

each link 30 is associated with only a single trace 52.” Pet. 43–44 (citing Ex. 1003 ¶ 80).

Patent Owner contends that Bruckman does not disclose this limitation under Patent Owner’s proposed construction which requires “wherein the first physical link is not fixedly assigned to the second physical link.” See PO Resp. 49. Patent Owner asserts that “Bruckman discloses a network element in which the links 30 are fixedly assigned to specific traces 52, and every link 30 corresponds directly only to a single trace 52.” *Id.* (reproducing Ex. 1005, Fig. 2 (with Petitioner’s annotations added)). Patent Owner asserts that “Petitioner concedes that the first links 30 are fixedly assigned to the second link (trace 52) in Bruckman.” *Id.* at 50–51.

We do not agree with Patent Owner’s arguments because, as explained above in Section II.A., we decline to adopt Patent Owner’s proposed construction that would add “wherein the first physical link is not fixedly assigned to the second physical link” to the claims.

Patent Owner also asserts that “[a] POSITA would understand that determining the Bruckman trace 52 based on the selection of Bruckman’s link 30 cannot amount to an actual selection of the trace (i.e., the second physical link from the second group of second physical links).” PO Resp. 51. Patent Owner contends that this is because selecting a second physical link out of a second group of second physical links “requires that there be more than one second physical link in the second group available to choose from, even if the first link is otherwise selected.” *Id.*; see PO Resp. 54 (“Bruckman discloses a hashing function that does not factor in the available traces”); Pet. Sur-reply 24 (“[T]he claims require that each first link selected for data transmission must correspond —via interface module—to a group of traces that can be selected.”), 25 (“[T]he claims

require selecting a second link from a group that corresponds to the first link that is selected.”).

Patent Owner asserts that Petitioner’s expert Dr. Houh testified that the absence of multiple traces 52 means there is only one path available for the data to travel, such that there is not a choice between the second group of traces 52. *See id.* at 51–53 (citing Ex. 2026, 72:15–73:18); PO Sur-reply 23–24. According to Patent Owner, Bruckman discloses that “selecting the link 30 leaves only one available option as to the trace over which to send the data frame.” PO Resp. 53; *see id.* at 54 (“Bruckman discloses a hashing function that does not factor in the available traces”); Pet. Reply 25 (“[E]ach of [Bruckman’s] links 20 corresponds, via a concentrator to single traces 52, not groups of traces . . . , thus leaving no choice as to the trace once the first link is selected.”); *see also* Pet. Reply 24 (“[F]inding that Bruckman’s transmission over the only available trace 52 amounts to ‘selecting’ from a group of traces would improperly render the second ‘selecting’ step void and meaningless,” citing *Wasica Fin. GMBH v. Cont’l Auto Sys., Inc.*, 853 F.3d 1272, 1288 n.10); 25 (“Bruckman’s hash function is a computation used for selecting one link, as there is no choice as to the second link.”).

In the Reply, Petitioner disputes Patent Owner’s argument that determining trace 52 based on the selection of link 30 cannot amount to an actual selection of the trace because there is only one path available for the data to travel. *See* Pet. Reply 19 (citing PO Resp. 51). According to Petitioner,

Bruckman’s system still makes a selection from one of several traces 52. In order to pass a packet from the communication network to the user node, the system selects one trace 52 out of the group and one link 30 out of the group. Even when a

particular link 30 is selected as the link to transmit a packet, Bruckman's system still selects the trace 52 that will transmit the packet to the appropriate line card 34 and concentrator to that selected link 30. In other words, there is still a selection of the trace 52 regardless of whether the selection of link 30 informs the selection of a trace.

Pet. Reply 19. Petitioner further asserts that the analysis for claim 11 provides further details on how Bruckman's links are separately selected through two separate sets of bits. *See id.* at 18 (citing Pet. 58–63).

In the Sur-reply, Patent Owner asserts that Petitioner did not raise the arguments addressing claim 11 with respect to claim 1 and the Board should decline to consider it. *See* PO Sur-reply 23 n.8 (citing *Apple Inc. v. MPH Techs. OY*, 2022 WL4103286 (Fed. Cir. 2022)).

We do not agree that the Petition's analysis addressing the patentability of dependent claim 11 (*see* Pet. 58–63) should be disregarded with respect to claim 1. We do not consider the analysis in the Petition addressing claim 11 to be new arguments because Patent Owner had the opportunity to address the claim 11 analysis in the Patent Owner Response. Unlike the *Apple* case cited by Patent Owner, the analysis for claim 11 referenced by Petitioner (*see* Pet. 58–63) is based on the same grounds of unpatentability as claim 1 (*see* Pet. 34–46), and claim 11 ultimately depends from claim 1.

We also do not agree with Patent Owner's substantive arguments. We agree with Petitioner that, in the flow of data from the core network to the network nodes 24, 26, 28 in Bruckman, there is a selection of a trace 52 out of the group of four traces 52 in order to send data to the appropriate line card 34, link 30, and node 24, 26, 28. We have reviewed Petitioner's analysis addressing dependent claim 11 (*see* Pet. 58–63) and find that this

analysis supports Petitioner’s contention that Bruckman teaches or suggests selecting a trace 52 out of the group traces 52. For these same reasons, we also do not agree with Patent Owner’s argument that “given that Bruckman discloses a system in which the trace is ‘determined’—and not selected—by the selection of a link 30, a POSITA would understand that Bruckman does not disclose the claimed selections in ‘a single computation.’” PO Resp. 53.

More particularly, the analysis addressing claim 11, cited by Petitioner, provides additional explanation that Bruckman’s equipment 22 is a two-level demultiplexer structure with concentrators 50 acting as a first level demultiplexer to select one of four links 30 and switching core 40 acting as a second-level demultiplexer by distributing data frames from the input channel among four separate traces 52. *See* Pet. 58–59 (reproducing Ex. 1005, Fig. 2 (with Petitioner’s added annotations); citing Ex. 1003 ¶ 137; Pet. 23–27). The cited analysis further explains that Bruckman’s equipment 22 shown in Figure 2 includes a control line from controller 42 to the switching core 40 and control lines to each of the concentrators 50. *See* Pet. 59–60 (reproducing Ex. 1005, Fig. 2 (with Petitioner’s added annotations); citing Ex. 1003 ¶ 138). According to Petitioner, “[g]iven this well-known, two-level structure, a POSITA would have found it obvious for Bruckman’s [e]quipment 22 to be controlled in a manner consistent with well-known two-level demultiplexer control techniques.” Pet. 59 (citing Ex. 1003 ¶ 138). The cited analysis further explains that “[b]ecause each of the demultiplexing devices (switching core 40 and concentrators 50) in [Bruckman’s] Fig. 2 has one input and four outputs, a POSITA would have found it obvious to control each with a two-bit command signal.” Pet. 60 (citing Ex. 1003 ¶ 139). According to Petitioner,

a two-bit command signal would be used to control the switching core (second-level demultiplexer) to select a trace 52. A different two-bit signal would be used to control the concentrators (first-level demultiplexers) to select a link 30, consistent with known techniques for controlling two-level demultiplexers. Such techniques . . . would have been in the background knowledge of a POSITA.

Pet. 61 (citing Ex. 1003 ¶ 139; Pet. 33); *see* Pet. 62–63 (reproducing Ex. 1007, Fig. 5.17(a) (with Petitioner’s annotations added); citing Ex. 1003 ¶¶ 139–141).

Patent Owner does not address or rebut Petitioner’s analysis addressing dependent claim 11. *See generally* PO Resp.; PO Sur-reply. Nonetheless, the burden remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

We also do not agree with Patent Owner’s arguments because they are is incorrectly premised on a requirement that the first selection of a first link occurs before the second selection of a second link, as well as a requirement that there must be more than one second physical link “available” for choosing in the second occurring selection. Patent Owner, however, asserts that there no temporal requirements for the selecting step. *See* PO Resp. 22–23. Moreover, claim 1 does not recite limitations directed to selecting links that are “available.”

Patent Owner further contends that “[a] POSITA would understand that if the first selection also determines the specific trace over which to transmit the data there would be no need for a single computation, as there would be no second mapping step, let alone complexity to mitigate stemming from that second step.” PO Resp. 53. Patent Owner asserts that the ’740 Patent Specification

supports this distinction with disclosures about (i) the lack of direct relationship between the first and second groups of physical links; (ii) the rationale behind providing these groups as separate from one another; (iii) the performance of two mapping operations in sequence (i.e., two selections); and (iv) the manner in which the single computation makes this process more efficient.

PO Resp. 53–54.

In the Reply, Petitioner asserts that Patent Owner’s arguments that the first and second selections must be performed in sequence is not explained. *See* Pet. Reply 30 (citing PO Resp. 54). Petitioner contends that, nevertheless, Patent Owner does not offer an explanation of how selections could be performed sequentially and yet still in a single computation and with no temporal requirement. *See id.* (citing PO Resp. 22–23, 54).

We do not agree with Patent Owner’s undeveloped arguments because they address the invention disclosed in the ’740 Patent Specification (e.g., need for a single computation, two mapping operations in sequence, etc.) rather than addressing the disputed limitations of the claims. *See In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998) (“[T]he invention disclosed in Hiniker’s written description may be outstanding in its field, but the name of the game is the claim.”).

Having considered both parties’ arguments and the evidence cited by the parties to support their respective arguments, we are persuaded that the Bruckman teaches or suggests “selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group.” Based on the entire record, we determine Petitioner shows that Bruckman teaches or suggests this limitation of claim 1. *See* Pet. 41–45, 58–63.

f. [1.7] sending the data frame over the selected first and second physical links,

[1.8] said sending comprising communicating along at least one of said bidirectional links.

Petitioner contends that Bruckman teaches or suggests these limitations based on Bruckman's disclosure that distributor 58 distributes data frames arriving from the network among links 30, and that it would have been obvious that sending a frame over a given link involved sending the data frame over the single trace that leads to that link. *See* Pet. 45–46 (citing Ex. 1003 ¶¶ 85–88; Ex. 1005 ¶ 58; Pet. 35–36, 39–45).

Patent Owner does not address or rebut Petitioner's showing for these limitations. *See* PO Resp. 33–62. In any event, the burden remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

Based on the entire record, we determine Petitioner shows that Bruckman teaches these limitations of claim 1. *See* Pet. 45–46.

g. Summary

Based on the entire record, Petitioner shows by a preponderance of the evidence that the subject matter of claim 1, as a whole, would have been obvious to a person of ordinary skill in the art in view of the teachings of Bruckman. *See* Pet. 34–46, 58–63, 67–68. Accordingly, based on the entire record, Petitioner has established by a preponderance of the evidence that claim 1 is unpatentable under 35 U.S.C. § 103(a) over Bruckman.

3. Analysis of Independent Claim 17

Independent claim 17 recites limitations similar to the limitations recited in claim 1, except that claim 17 is directed to an apparatus, whereas claim 1 is directed to a method. *Compare* Ex. 1001, 10:65–11:20 *with*,

Ex. 1001, 17:35–58. Petitioner’s analysis addressing the limitations of claim 17 is substantially the same as, and relies upon, Petitioner’s analysis addressing claim 1. *Compare* Pet. 70–71 *with*, Pet. 30–46. Patent Owner’s arguments address claims 1–13 and 17–28 together as a group, and do not specifically address the limitations of claim 17 apart from the disputed limitations common to claims 1 and 17. *See* PO Resp. 33–62.

Based on the entire record and including the reasons explained above addressing claim 1, we determine Petitioner shows by a preponderance of the evidence that the subject matter of claim 17, as a whole, would have been obvious to a person of ordinary skill in the art in view of the teachings of Bruckman. *See* Pet. 34–46, 58–63, 67–68, 70–71. Accordingly, based on the entire record, Petitioner has established by a preponderance of the evidence that claim 17 is unpatentable under 35 U.S.C. § 103(a) over Bruckman.

4. Analysis of Dependent Claims 2, 3, 6–12, 18, and 21–27

Claims 2, 3, and 6–12 depend directly or indirectly from claim 1, and claims 18 and 21–27 depend directly or indirectly from independent claim 17. *See* Ex. 1001, 11:21–28, 12:1–35, 13:59–62, 14:36–15:2. We have reviewed Petitioner’s contentions and cited supporting evidence addressing how Bruckman discloses, teaches, or suggests each of the limitations recited in dependent claims 2, 3, 6–12, 18, and 21–27. *See* Pet. 47–49, 51–64, 72–73 (citations omitted). Patent Owner’s arguments address claims 1–13 and 17–28 together as a group, and do not specifically addressing the limitations of dependent claims 2, 3, 6–12, 18, and 21–27 apart from the disputed limitations of claim 1 and 17. *See* PO Resp. 33–62

Based on the entire record and including the reasons explained above addressing claims 1 and 17, we determine Petitioner shows by a preponderance of the evidence that the subject matter of claims 2, 3, 6–12, 18, and 21–27, as a whole, would have been obvious to a person of ordinary skill in the art in view of the teachings of Bruckman. *See* Pet. 34–49, 51–64, 67–68, 70–73. Accordingly, based on the entire record, Petitioner has established by a preponderance of the evidence that claims 2, 3, 6–12, 18, and 21–27 are unpatentable under 35 U.S.C. § 103(a) over Bruckman.

5. Analysis of Independent Claims 4, 5, 13, 19, 20, and 28

Independent claims 4 and 19 recite substantially the same limitations as claim 1, but additionally recite “at least one of the first and second groups of physical links comprising an Ethernet link aggregation (LAG) group.” Ex. 1001, 11:44–45, 14:14–15. Independent claim 5 recites substantially the same limitations as claim 1, but additionally recites “coupling the network node to the one or more interface modules comprises aggregating two or more of the first physical links into an external Ethernet link aggregation (LAG) group so as to increase a data bandwidth provided to the network node.” Ex. 1001, 11:63–67. Independent claim 20 recites limitations similar to claim 5, but, like independent claim 17, is directed to an apparatus. *Compare* Ex. 1001, 14:15–35 *with*, Ex 1001, 11:47–67. Independent claim 13 recites substantially the same limitations as claim 1, but additionally recites

coupling the network node to the one or more interface modules and coupling each of the one or more interface modules to the communication network comprising specifying bandwidth requirements comprising at least one of a committed information rate (CIR), a peak information rate (PIR) and an excess information rate (EIR) of a communication service provided by the communication network to the network node,

and allocating a bandwidth for the communication service over the first and second physical links responsively to the bandwidth requirements.

Ex. 1001, 12:53–63. Independent claim 28 recites limitations similar to claim 13, but, like independent claim 17, is directed to an apparatus.

Compare Ex. 1001, 15:3–28 *with*, Ex 1001, 12:36–63.

We have reviewed Petitioner’s contentions and cited supporting evidence addressing how Bruckman discloses, teaches, or suggests each of the additional limitations recited in independent claims 4, 5, 13, 19, 20, and 28. *See* Pet. 49–51, 64–66, 73, 74.

Patent Owner’s arguments substantively address claims 1–31 together as a group, and do not specifically address the additional limitations of independent claims 4, 5, 13, 19, 20, and 28 apart from the disputed limitations that are common to independent claims 1, 4, 5, 13, 17, 19, 20, and 28. *See* PO Resp. 33–62.

Based on the entire record and including the reasons explained above addressing claims 1 and 17, we determine Petitioner shows by a preponderance of the evidence that the subject matter of independent claims 4, 5, 13, 19, 20, and 28, as a whole, would have been obvious to a person of ordinary skill in the art in view of the teachings of Bruckman. *See* Pet. 34–46, 49–51, 58–66, 67–68, 70–71, 73, 74. Accordingly, based on the entire record, Petitioner has established by a preponderance of the evidence that claims 4, 5, 13, 19, 20, and 28 are unpatentable under 35 U.S.C. § 103(a) over Bruckman.

6. Analysis of Independent Claims 14 and 29

Independent claim 14 recites substantially the same limitations as claim 1, however, claim 14 recites “coupling each user interface module to

the communication network via a backplane using two or more backplane traces arranged in parallel” instead of “coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel,” as recited in claim 1. *Compare* Ex. 1001, 11:4–6 *with*, Ex. 1001, 13:1–13. Claim 14 also recites “for each data frame, selecting responsively to at least one of the respective frame attributes a backplane trace from the two or more backplane traces” instead of “selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group,” as recited in claim 1. *Compare* Ex. 1001, 11:13–16 *with*, Ex. 1001, 13:10–12. Independent claim 29 recites limitations similar to claim 14, but, like independent claim 17, is directed to an apparatus. *Compare* Ex. 1001, 12:64–13:15 *with*, Ex 1001, 15:29–16:19. Petitioner relies on its analysis for independent claims 1, 17, and 19, and several claims dependent therefrom to address the limitations that are common to claims 1, 17, 14, 19, and 29. *See* Pet. 66–68, 74–75.

To address the limitation “coupling each user interface module to the communication network via a backplane using two or more backplane traces arranged in parallel,” Petitioner relies on its analysis addressing claim 1 and also contends that “each of Bruckman’s two line cards 34 (*‘interface modules’*) includes at least two traces 52 that connect that line card to the communication network.” Pet. 67–68 (reproducing Ex. 1005, Fig. 2 (with Petitioner’s added annotations); citing Ex. 1003 ¶¶ 160–162). To address the limitation, “for each data frame, selecting responsively to at least one of the respective frame attributes a backplane trace from the two or more backplane traces,” Petitioner relies on its analysis addressing claim 1. Pet. 68 (citing Ex. 1003 ¶ 165).

Patent Owner contends that for the same reasons as those addressing claim 1, Bruckman does not “select[] between backplane traces. Instead, [Bruckman] disclose[s] selecting a user port; and it is only after a port is selected that a second link or trace is determined based on that port, not selected.” PO Resp. 63 (citing PO Resp. 47–63). Patent Owner asserts that the first links in Bruckman are fixedly assigned to the traces. *See id.* at 64. Patent Owner contends that Bruckman “at best disclose[s] selecting user ports, not backplane traces.” *Id.* Patent Owner repeats, in somewhat different terms, many of the same arguments addressing Bruckman that were presented addressing claim 1. *Compare* PO Resp. 64–67 *with*, PO Resp. 48–54. For the same reasons as those explained above in Section II.D.2.e. addressing claim 1, we do not agree with Patent Owner’s arguments. Consistent with Petitioner’s analysis (*see* Pet. 41–45, 58–63) and the analysis above in Section II.D.2.e, addressing claim 1, we find that Bruckman teaches or suggests selecting a backplane trace 52 from the two or more backplane traces 52.

Patent Owner further asserts that the Petition completely fails to explain how Bruckman considers frame attributes in selecting a backplane trace. We do not agree with Patent Owner’s arguments because Petitioner’s analysis addressing claim 1 and dependent claim 11, as discussed above in Section II.D.2.e, explains that the Bruckman’s frame header is a frame attribute, distributor 58 applies a predetermined hash function to the header information, and a person of ordinary skill in the art would have found it obvious that the hashing function selects which link 30 and which trace 52 will transmit the data frame from the core network to the customer node. *See* Pet. 41–45, 58–63.

Having considered both parties' arguments and the evidence cited by the parties to support their respective arguments, we are persuaded that Bruckman teaches or suggests "for each data frame, selecting responsively to at least one of the respective frame attributes a backplane trace from the two or more backplane traces."

Specifically with respect to claim 29, Patent Owner asserts that Petitioner does not meet its burden to prove unpatentability based on the analysis for the limitation labeled by Petitioner as 29.3. *See* PO Resp. 67–69 (citing 35 U.S.C. § 316(e), *FanDuel, Inc. v. Interactive Games LLC*, 966 F.3d 1334, 1341). Patent Owner contends that Petitioner's analysis that incorporates by reference the analysis for dependent claims 3 and 18 does not explain how Bruckman discloses a "plurality of backplane traces arranged in parallel so as to transfer the data frames between the one or more user interface modules and the communication network," as recited in claim limitation 29.3. *See id.* at 67–68.

We have reviewed the Petition, and find that Petitioner satisfies its burden based on the incorporation by reference of the analysis for dependent claims 3 and 18, which include all of the limitations of claims 1 and 17, respectively. Pertinent to limitation 29.3, independent claim 17 recites "a second group of second physical links arranged in parallel so as to couple the one or more interface modules to the communication network" and dependent claim 18 recites "wherein the second physical links comprise backplane traces formed on the backplane." This limitation of claim 17 and the limitation of claim 18 together are substantially similar to limitation 29.3. We find that, because dependent claim 18 includes all of the limitations of claim 17 from which it depends, the Petition's analysis for claim 18 necessarily includes the pertinent analysis for claim 17. For the

same reasons as those explained above addressing claims 1 and 17, we do not agree with Patent Owner's argument that Bruckman fails to disclose traces that are arranged in parallel. *See* PO Resp. 69. We have reviewed the Petition, and find that Petitioner has met its burden with respect to limitation 29.3. *See* Pet. 34–46 (claim 1), 49 (claim 3), 70–72 (claim 17), 72–73 (claim 18), 75 (claim limitation 29.3).

Patent Owner also asserts that the Petition omits any discussion of limitations labeled by Petitioner in the Claim Appendix as 29.1 and 29.2. *See* PO Resp. 69. Patent Owner asserts that Petitioner fails to satisfy its burden to meet the requirements for a petition pursuant to 37 C.F.R. §§ 42.104(b)(4), 42.22(a)(2), and urges the Board to find claim 29 patentable on this basis. *See* PO Resp. 70. We have reviewed the Petition's analysis for claim 29, and find the Petition meets the regulatory requirements. *See* Pet. 34–46 (claim limitation 1), 39–40 (claim limitation 1.4), 49 (claim 3), 70–72 (claim 17.0), 72–73 (claim 18), 73 (claim limitation 19.4), 74–75 (claim 29). More specifically, although we agree that the Petition does not include the same labels for claim 29 provided in the Claim Appendix, we find that Petitioner's analysis for claim 29, as a whole, addresses the limitations in question by incorporating by reference the Petition's analysis for other claims, particularly limitations labeled 17.0–17.2. *See* Pet. 74. The limitations corresponding to 29.0–29.2 are substantially identical to the limitations corresponding to 17.0–17.2. *Compare* Pet. 97–98 (Claim Appendix listing for claim 17) *with*, Pet. 103 (Claim Appendix listing for claim 29).

Based on the entire record and including the reasons explained above addressing claim 1, we determine Petitioner shows by a preponderance of the evidence that the subject matter of claims 14 and 29, as a whole, would

have been obvious to a person of ordinary skill in the art in view of the teachings of Bruckman. *See* Pet. 34–46, 58–63, 66–68, 70–75.

Accordingly, based on the entire record, Petitioner has established by a preponderance of the evidence that claims 14 and 29 are unpatentable under 35 U.S.C. § 103(a) over Bruckman.

7. Analysis of Independent Claims 15, 16, 30, and 31

Independent claims 15 and 30 recite substantially the same limitations as claims 14 and 29, but further recite 1 “at least some of the backplane traces being aggregated into an Ethernet Link aggregation (LAG) group.” Ex. 1001, 13:30–31, 16:30–31. Petitioner relies on its analysis for claims 1, 3, 4, and 14 to address the limitations that are common to claims 15 and 30. *See* Pet. 68–69, 75. Petitioner relies on its analysis for dependent claims 8 and 9 to address the limitations that are common to claims 16 and 31. *See* Pet. 69, 75.

Patent Owner’s arguments substantively address claims 1–31 together as a group, and do not specifically address the additional limitations of claims 15, 16, 30, and 31 apart from the disputed limitations that are common to independent claims 1, 14, 15, 17, 29, and 30. *See* PO Resp. 33–67.

Specific to claim 30, Patent Owner asserts that the Petition omits any discussion of the limitation labeled by Petitioner in the Claim Appendix as 30.2 that requires “which are arranged to process data frames having frame attributes sent between the user ports and the communication network.” *See* PO Resp. 69–70. Patent Owner asserts that Petitioner fails to satisfy its burden to meet the requirements for a petition pursuant to 37 C.F.R. §§ 42.104(b)(4), 42.22(a)(2), and urges the Board to find claim 30

unpatentable on this basis. *See* PO Resp. 70. We have reviewed the Petition’s analysis addressing claim 30, and find that the Petition meets the regulatory requirements. *See* Pet. 34–46 (claim 1), 49 (claim 3), 66 (claim limitation 14.0), 69 (claim limitation 15.5) 70–72 (claim 17), 72–73 (claim 18), 73 (claim limitation 19.4), 74 (claim limitation 29.3). More specifically, although we agree that the Petition does not include the same labels for claim 30 provided in the Claim Appendix, we find that Petitioner’s analysis for claim 30, as a whole, addresses the limitation in question by incorporating by reference the Petition’s analysis for other claims, particularly the limitation labeled 17.1. *See* Pet. 75. The limitation labeled 30.2 in the Claim Appendix is substantially identical to the limitation labeled 17.1. *Compare* Pet. 97–98 (Claim Appendix listing for claim 17) *with*, Pet. 103–104 (Claim Appendix listing for claim 30).

Based on the entire record and including the reasons explained above addressing independent claims 1 and 17, we determine Petitioner shows by a preponderance of the evidence that the subject matter of claims 15, 16, 30, and 31, as a whole, would have been obvious to a person of ordinary skill in the art in view of the teachings of Bruckman. *See* Pet. 34–46, 58–63, 66–68, 70–75. Accordingly, based on the entire record, Petitioner has established by a preponderance of the evidence that claims 15, 16, 30 and 31 are unpatentable under 35 U.S.C. § 103(a) over Bruckman.

E. Additional Patentability Challenges

Petitioner challenges claims 1–31 as unpatentable over Bruckman and Basso. *See* Pet. 21. Petitioner also challenges dependent claims 11 and 26 on the basis of Bruckman and Holdsworth, as well as Bruckman, Basso, and Holdsworth. *See* Pet. 21, 76–79. We need not determine the merits of these

patentability challenges because, as explained above, Petitioner has shown by a preponderance of the evidence that claims 1–31 are unpatentable under 35 U.S.C. § 103 over Bruckman. *See SAS Inst. Inc. v. Iancu*, 584 U.S. 357, 363 (2018) (holding that a petitioner “is entitled to a final written decision addressing all of the claims it has challenged”); *Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (finding an administrative agency is at liberty to reach a decision based on a single dispositive issue because doing so “can not only save the parties, the [agency], and [the reviewing] court unnecessary cost and effort,” but can “greatly ease the burden on [an agency] faced with a . . . proceeding involving numerous complex issues and required by statute to reach its conclusion within rigid time limits”); *Bos. Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App’x 984, 990 (Fed. Cir. 2020) (non-precedential) (recognizing that the “Board need not address issues that are not necessary to the resolution of the proceeding” and, thus, agreeing that the Board has “discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims”).

III. CONCLUSION

For the foregoing reasons, and after having analyzed the entire record and assigning appropriate weight to the cited supporting evidence, Petitioner has established by a preponderance of the evidence that claims 1–31 are unpatentable.⁷

⁷ Should Patent Owner pursue amendment of the challenged claims in a reissue or reexamination proceeding, we direct 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 files a reissue application or a request for reexamination, Patent Owner is reminded of its

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–31	103(a)	Bruckman	1–31	
1–31	103(a)	Bruckman, Basso		
11, 26	103(a)	Bruckman, Holdsworth		
11, 26	103(a)	Bruckman, Basso, Holdsworth		
Overall Outcome			1–31	

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, Petitioner has established by a preponderance of the evidence that claims 1–31 of the '740 Patent are unpatentable; and

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

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).

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