

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.
Petitioner,

v.

ORCKIT CORPORATION,
Patent Owner.

Case IPR2023-00714
U.S. Patent No. 6,680,904

PATENT OWNER'S SUR-REPLY

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EXHIBIT LIST	
2001	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 46 (E.D. Tex., Jan. 15, 2023), First Amended Docket Control Order (“First Amended Docket Control Order”)
2002	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 28 (E.D. Tex., Nov. 4, 2022), Notice of Compliance (“11-4-2022 Notice of Compliance”)
2003	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 47 (E.D. Tex., Jan. 19, 2023), Notice of Compliance (“1-19-2023 Notice of Compliance”)
2004	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 55 (E.D. Tex., Mar. 23, 2023), Defendant’s Motion To Stay
2005	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 56 (E.D. Tex., Mar. 29, 2023), Order Denying Motion to Stay
2006	United States District Courts National Judicial Caseload Profile For the 12 Months Ending March 31, 2023 (available at https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distprofile0331.2023.pdf) (“Judicial Caseload Statistics”)
2007	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 50 (E.D. Tex., Feb. 3, 2023), Notice of Compliance (“2-3-2023 Notice of Compliance”)
2008	Reserved
2009	Reserved
2010	Reserved

2011	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 59 (E.D. Tex., Mar. 30, 2023), Order Granting Motion To Amend Invalidity Contentions
2012	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 61 (E.D. Tex., April 13, 2023), Order Granting Motion To Amend Invalidity Contentions
2013	“About Orckit-Corrigent: Executive Summary,” 2011
2014	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (Cover Pleading)
2015	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (Exhibit A - ’904 Patent Charts)
2016	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (Exhibit B - ’821 Patent Charts)
2017	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (Exhibit C - ’740 Patent Charts)
2018	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (Exhibit D - ’111 Patent Charts)
2019	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (Exhibit E - Combination Charts)
2020	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (SME Contentions)

2021	United States District Courts National Judicial Caseload Profile For the 12 Months Ending December 31, 2022 (available at https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distprofile1231.2022.pdf) (“December 22 Judicial Caseload Statistics”)
2022	Declaration of George Stamatopoulos in support of Patent Owner’s Motion for Pro Hac Vic Admission
2023	Declaration of Michael Ng in support of Patent Owner’s Motion for Pro Hac Vice Admission
2024	Stipulation of Dismissal
2025	Declaration of Miguel Gomez
2026	CV of Miguel Gomez
2027	Transcript of the Deposition of Dr. Henry Houh

I. INTRODUCTION

For the reasons discussed in detail below and in the POR, Vink does not disclose claimed masters with a physical interface to a packet-switched network or ports to subscriber lines; and Petitioner has failed to show that a POSA would (or could) have combined Vink (which is indisputably incompatible with external network access) with Patrick and/or AAPA to provide subscribers with network access in the manner claimed in the patent, *i.e.*, via the two masters interfacing with the “core” network. The Board should thus confirm the patentability of all challenged claims.

II. CLAIM CONSTRUCTION

A. “Subscriber Lines”

“Subscriber lines” should be construed as “communication lines to users of subscription-based network services.” POR, 20.

Petitioner argues that no construction is needed because the proposed construction only applies to whether Vink alone teaches “subscriber lines”—not whether Patrick or AAPA suggests “subscriber lines” in view of Vink. Reply, 6. A construction is needed because the Petition incorrectly identifies inputs (34) and outputs (33) of Vink’s I/O module 10 as “ports to subscriber lines:”

Vink teaches that each of the slaves 2, 3, 4, and 5 includes a transmitting/receiving unit 6 and control module 9, which in turn is connected to one or more input/output (I/O) modules 10. [...]

These inputs and outputs also include connections to subscriber lines because the I/O modules 10 are connected to other devices.

Petition, 32-33. Because the Parties dispute whether Vink’s connections to other devices are “subscriber lines,” the Board must construe “subscriber lines” to resolve this dispute. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019). Further, because PO’s proposed construction is supported by the record (which Petitioner does not dispute), the Board should adopt it for the reasons stated in the PO Response. POR, 20.

III. THE CHALLENGED CLAIMS ARE PATENTABLE

A. Claims 1, 4, 9, 11, 14, and 19: The prior art does not suggest a physical interface to a “core” network

Each independent claim recites a network access apparatus or method in which master units have a “physical interface to a packet-switched network”¹ and daisy-chained slaves provide network access to subscribers via “ports to ... subscriber lines.” A POSA would understand that the claimed “packet-switched network” *is* a “core” network *external* to the loops formed by the masters and slaves. POR, 24-25. Contrary to Petitioner’s assertions (Reply, 7-9), this understanding is evident from the claim language and the specification.

¹ Or “network,” in claim 19.

First, elements 1b/4b/9b/11b of the independent claims recite “subscriber lines” (the construction of which Petitioner does not dispute), *i.e.*, communication lines to users of subscription-based network services. The masters in the “network access apparatuses” must therefore provide the slaves servicing these “subscribers” with access to an external (or “core”) network. Construing the masters’ physical network interfaces as internal interfaces—rather than interfaces to an external “core” network—would defeat the purpose of the claimed network access apparatuses by improperly eliminating the network access they provide to the claimed subscribers.

Second, the claims already recite that the “first slave” is connected to the “first master unit” and the “last slave” is connected to the “second master unit.”⁹⁰⁴ Patent, 11:50-55. Construing the masters’ physical interface as a connection to the slave units would thus be improperly redundant.

Third, the ’904 Patent specification describes the preferred embodiment of the invention as a “multi-shelf access system.” POR, 24-25. A POSA would understand that a “multi-shelf access system” with masters is used to provide subscribers with access to a “core” network via slaves that interface with the network through those masters. Ex2025, ¶¶56-57. Further, there are no disclosed embodiments in which masters do not provide access to a “core” network.

Petitioner incorrectly asserts that claim [14b] contradicts a POSA’s understanding that the claimed physical interfaces in the masters are to an external

network. Reply, 7-9. The physical interfaces of element [14b] are distinct from the “physical interface to a packet-switched network” that the claimed masters provide in other limitations (e.g., 1[a], 4[a], 9[a], 11[a])² and recited *separately* in Claim 14’s preamble (“a master unit is connected by *a physical interface to a packet-switched network...*”). The physical interface of [14b] to which Petitioner points does not thus contradict that the claimed masters’ “physical interface” is to a “core” network.

Accordingly, a POSA would understand that the claimed physical interface is to a “core” network.

1. Vink’s “internal” network cannot satisfy claim 1.

Petitioner argues for the first time in the Reply that Vink’s “internal” network satisfies the claimed physical interface to a packet switched network. Reply, 9-10. This argument fails.

First, the Petition admits that Vink does not disclose masters accessing core networks:

² Claim 19 also shows that a POSA would understand the claimed interfaces are to an external network by reciting “coupling first and second master units to interface with the network,” and “conveying initial downstream data packets received from the network by one of the master units” to the “ports of the slave units.”

Although *Vink does not explicitly teach that master 1 accesses a network*, master stations connected to networks were well-known.

Petition, 20. Having admitted in the Petition that Vink's masters do not access a core network, it is improper for Petitioner to assert *the opposite for the first time in its Reply*. *Acceleration Bay, LLC v. Activision Blizzard Inc.*, 908 F.3d 765, 775 (Fed. Cir. 2018).

Second, Petitioner's assertion that Vink's connections between its master and slaves form a packet-switched network does not address the relevant claim language. As discussed *supra*, the requirement that the master units comprise physical interfaces to a packet-switched network (e.g., 1[a]) is *separate* from the "physical interface lines" connecting the masters to the slaves (e.g., 1[c]). Consistent with this understanding, the Petition mapped alleged "masters with a physical interface to an external pack-switched network" onto 1[a] (*i.e.*, the claimed "physical interface to a packet-switched network" (Petition, 24-31)) and the transmission lines between Vink's master and slaves onto 1[c] (*i.e.*, the claimed "physical interface lines" that link the master unit to the slave units (Petition, 36-37)). Because the Petition identifies the claimed physical interface to a packet-switched network separately from the physical interface between the master and the slaves, Petitioner cannot rely on Vink's "internal" network (*i.e.*, the LAN made up of Vink's masters and the

slaves without access to a core network) as the “packet-switched network” to which the masters provide a “physical interface.”

Third, Vink cannot satisfy a physical interface to a packet switched network because a POSITA would understand for reasons discussed *supra* in II.A. that the claimed network is an external, core network, *i.e.*, one through which the claimed subscribers gain access to network-based subscription services.

In any event, there is no evidence that Vink’s “internal” network is a packet-switched network as claimed. Petitioner has never alleged that the connections between a master and a slave form a packet-switched network or introduced evidence to support this assertion.

Accordingly, Vink’s “internal” network does not suggest a physical interface to a packet switched network.

2. A POSA would not combine Vink’s system with Patrick or AAPA because Vink’s addressing system is incompatible with an external network.

Vink discloses a local area network (“LAN”) that is not designed to connect to a “core” network or to service subscribers. POR, 25-44.

Petitioner does not dispute that Vink would need a *hierarchical* address system to interface with an external “core” network. *Compare* POR, 25-44 with Reply, 11-13. The POR explains that Vink uses only a *non-hierarchical* (or flat) address system that assigns a fixed address to each slave based on its order in a chain.

Id. Vink’s LAN is thus incompatible with external networks, for example, those in Patrick or AAPA. *Id.*

Petitioner incorrectly asserts that Vink is compatible “with external networks” because it discloses “a two-level hierarchical addressing scheme that includes (1) a slave address and (2) added address information bits.” Reply, 11-12.

First, the Board should not credit this assertion because it is pure attorney argument (*see id.*), made for the first time in the Reply, and lacks any evidentiary support, let alone evidence rebutting PO’s arguments and Mr. Gomez’s expert testimony that Vink’s system is non-hierarchical and incompatible with external networks. *See, e.g.*, POR, 28-36; Ex2025 ¶¶59-71.

Second, contrary to Petitioner’s assertion that Mr. Gomez’s opinions are “unsupported by objective evidence,” his testimony is based on Vink’s express disclosures, backed by his industry experience, and confirmed by Petitioner’s expert Dr. Houh, who testified that Vink discloses a non-hierarchical addressing system. *Id.*; Ex2025, ¶75 (“I am personally familiar with the processes that engineering companies at that time would use to provide access to external networks.”); Ex2027, 54:19-55:2 (“Q. Have you encountered such a nonhierarchical address system...? A. ... Vink talks about addressing in some sort of order, all right? So ...the ordering ... is not necessarily hierarchical there because it’s based on ordering of the devices.”)

Third, Petitioner’s unsupported attorney argument mischaracterizes Vink. Vink’s statement that “it is advantageous to provide a slave with an unambiguous address and to *add address information bits to the data bits to be exchanged*” (Ex1005, 11:29-37) does not teach that the added address information bits are part of Vink’s unambiguous address or that they render it hierarchical (which would contradict Petitioner’s expert) but that address information bits are added to the data bits “*to be exchanged*.” This is different from the ’904 Patent in which different levels of information are used to form an address hierarchy, as Mr. Gomez correctly testified. Ex1013 128:2-14. Consistent with Mr. Gomez’s (and Dr. Houh’s) testimony, Vink does not use hierarchical addressing; and neither expert testified that the address information bits in Vink are part of its address.

Petitioner also asserts (again without expert or other support) that “[e]ven if Vink only taught a nonhierarchical addressing scheme, the ’904 Patent discloses that same nonhierarchical addressing scheme as one possible embodiment,” citing an embodiment discussing a “pre-switch ... ‘next’ address.” Reply, 13. But as Mr. Gomez testified, the pre-switch address (or “PSA”) is part of a hierarchical addressing scheme because the systems disclosed in the ’904 patent “connect[] to a network ... [a]nd in order to do so that would require hierarchical addressing.” Ex1013, 194:1-25. Indeed, the ’904 Patent does not state that the “next” address is stripped of hierarchical “tiers” that would render it part of a non-hierarchical

addressing scheme. *See* Ex2027, 55:3-13 (Dr. Houh agreeing that hierarchical addressing users “tiers of addresses”). Rather, the use of scare quotes around the word “next” indicates that the “next” address is the hierarchical address of the next slave in the chain. Unlike the ’904 Patent’s hierarchical addressing, both experts testified that Vink uses a non-hierarchical “unambiguous address” based on device “order” in a sequence. *E.g.*, Ex2027, 54:19-55:2 (explaining that Vink is not hierarchical “because it’s based on ordering of the devices”).

Accordingly, Petitioner has failed to show that Vink could be combined with Patrick and/or AAPA. *MobileMedia Ideas LLC v. Apple, Inc.*, 780 F.3d 1159, 1167-68 (Fed. Cir. 2015) (“[E]ven when a technique has been used to improve a device, and a skilled artisan would recognize that it could improve other devices in the same way, using that technique may not be obvious if its actual application is beyond his or her level of skill. Here, [PO’s] expert testified that integrating the Lucent microprocessor to control the camera of the Kyocera mobile phone in the manner required by the asserted claims would be beyond the technical ability of a skilled artisan...[W]e agree [that] one of skill in the art would not have been motivated to combine the Lucent and Kyocera references to arrive at the claimed invention.”).

3. Even setting aside Vink’s incompatibility with external networks, Petitioner fails to explain why a POSA would combine Vink and Patrick or AAPA

Petitioner fails to provide a rationale for which a POSA would combine Vink with Patrick or AAPA and modify the resulting combination to provide an interface to a core network in the manner claimed. POR, 36-44.

As an initial matter, Vink is limited to LANs that employ peripheral, non-subscriber devices for “measurement and control applications, monitoring purposes and data acquisition” in “industrial measurement and control environments.” POR, 27. Petitioner has not shown that Vink’s non-subscriber peripherals would benefit from access to an external network. POR, 36-44. There was thus no “known problem” (*compare with* Reply, 14) that a POSA would try to address by combining Vink with Patrick or AAPA. Indeed, all of the applications that Petitioner’s expert identified as examples that would benefit from network access **were not in use** as of the priority date of the ’904 Patent. POR, 38 (citing Ex2027). Thus, unlike in *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 800 (Fed. Cir. 2021), Petitioner has not identified how Vink’s peripherals would benefit from core network access. Further, Petitioner is wrong that PO does not dispute “gaining access to external networks would have been beneficial.” *See* Reply 15. There is no evidence whatsoever that Vink’s LAN would benefit from external network access in the manner recited in the ’904 Patent claims. On the contrary, there is irrefutable evidence that Vink is a

closed LAN, with no subscribers, and designed to use an addressing scheme that is incompatible with the claimed manner of external network access (i.e., through its masters).

To overcome these facts, Petitioner incorrectly asserts that Mr. Gomez identified modems as potential peripherals servicing subscribers. Reply, 15-16. There are two problems with this assertion. First, Vink does not disclose modems as potential peripherals. Second, modems would provide Vink's non-subscriber stations *direct* access to an external network, thus obviating the need for network access through physical interfaces in Vink's masters, *i.e.*, in the manner claimed in the '904 Patent. Rather than support Petitioner's purported motivation to combine, Mr. Gomez's testimony about modems (Reply, 15-16) only shows that there were various ways to provide subscribers with network access *other* than the manner claimed (e.g., via modem), further underscoring Petitioner's failure to carry its burden that a POSA would combine Vink with Patrick and AAPA to practice the invention in the manner claimed. *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, n.4 (Fed. Cir. 2018) ("Merely stating that a particular placement of an element is a design choice does not make it obvious. Instead, the Board must explain why a person of ordinary skill in the art 'would have selected these components for combination in the manner claimed.'").

Even if Petitioner had demonstrated that Vink's peripherals would benefit from external network access (it has not), there is *no* evidence that a POSA would be motivated to provide such access through an interface in Vink's two master units (*i.e.*, in the manner claimed), let alone combine or adapt Vink as Petitioner proposes. *InTouch Technologies, Inc. v. VGO Communications, Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014) ("obviousness concerns whether a skilled artisan *not only could have made but would have been motivated* to make the combinations or modifications of prior art to arrive at the claimed invention"). In any event, given Vink's incompatibility with external networks, combining Vink with AAPA/Patrick would not yield a "suitable option" (as Petitioner concedes is required (Reply, 15)) for providing network access to Vink's peripherals. Nor has Petitioner argued, or adduced evidence that a POSITA would adapt Patrick or AAPA's systems in light of Vink.

Accordingly, Petitioner has failed to carry its burden with respect to a motivation to combine Vink with Patrick and/or AAPA.

4. Petitioner fails to rebut PO's evidence that the claimed combination was beyond the skillset of a POSA.

Petitioner must show that combining Vink with Patrick or AAPA to practice the invention in the manner claimed was within the skillset of a POSA. *MobileMedia Ideas*, 780 F.3d at 1167-68. To do so, Petitioner must show that a POSA had the

skill to connect *Vink's* LAN—and not just any LAN—to an external network. Petitioner has failed to do so, and as explained in the POR, modifying Vink to interface with a core network was not within a POSA's skillset. POR, 41-44.

The summary of the POR's arguments and Mr. Gomez's opinions is that: (i) there is no teaching in the record as to “how to adapt masters in a limited local area network such as Vink's to interface with an external core network (Ex2025, ¶73);” (ii) routing data from an external network to Vink's peripherals through its masters would have required “reprogramming Vink's non-hierarchical LAN protocols” with “custom solutions” and investing “significant time ... from an expert in the field” (*id.*, ¶74); and (iii) there were no off-the-shelf solutions that could allow a POSITA to adapt Vink without expertise beyond the ordinary level of skill (*id.*, ¶¶74-75). POR 41-44. Petitioner has not adduced rebuttal evidence.

Petitioner asserts that Red Hat Linux would have allowed connecting Vink's system to an external network. Reply, 16. As Mr. Gomez testified, “[c]ontrary to Dr. Houh's conclusory testimony, [he is] not aware of any off-the-shelf software suites or programs that would enable a POSA to provide Vink with the option of connecting to such a network[; indeed], Vink uses a sequential addressing protocol that was incompatible with internet addressing protocols as of the priority date[.]” (Ex2025, ¶75, fn.1). Petitioner has not adduced evidence rebutting this opinion. Nor is there *any* evidence in the record whatsoever about the purported “Red Hat Linux”

system's availability, version, operation, ability to facilitate connection of a non-hierarchical system like Vink's to an external network, or any other detail.³

Petitioner cites Patrick and AAPA as evidence of *other* LANs connected to external networks. Reply, 16-18. But these systems—notwithstanding any alleged similarities with Vink (which PO does not concede)—do not provide evidence as to whether a POSITA could adapt *Vink's* non-hierarchical system to connect to an external network via its two masters, *i.e.*, in the manner claimed in the '904 Patent, to practice the invention. The POR explains why a POSA could not combine or adapt Vink to practice the claims. POR, 28-36. PO's expert testified at length that this was beyond a POSA's skill. *Supra*. Petitioner has not rebutted his opinions. Rather, Petitioner relies *on nothing but its attorney's assertions* that disclosures in AAPA and Patrick about LANs *other* than Vink's non-hierarchical LAN support Petitioner's positions that modifying Vink was trivial because "connecting LANs to external networks was routinely done." *See* Reply, 16-18 (lacking any expert support for the attorney assertions that *other* LANs could be connected to the internet). Respectfully, the Board should not credit Petitioner's attorney assertions.

³ PO invited Dr. Houh to provide details on cross-examination; but as the POR notes, his answers were conclusory and non-responsive. PO, 41-42.

Even if there were a reason to combine or adapt Vink (there is not), Petitioner has failed to carry its burden that doing so was within a POSA's skill.

B. Claims 1, 4, 11, 14, and 19: The prior art does not suggest ports to “subscriber lines”

Petitioner concedes that Vink does not suggest “subscriber lines” under the proper construction—which it does not dispute. Instead, Petitioner argues that “Patrick/AAPA, when combined with Vink, [teaches] ‘subscriber lines’ and ‘ports.’” Reply, 18. Vink, however, is incompatible with external networks and would thus not be combined with Patrick and AAPA for the reasons explained in Section III.A.2.

In addition, Patrick and AAPA already operate effectively to serve subscribers without the need to deploy their subscriber lines in Vink's topology, and Petitioner provides no rationale for adapting Vink's topology to their systems, or vice versa. POR, 45-47. Finally, for the reasons in Section III.A.3, there is no evidence that Vink's interfaces (which are suited to peripheral devices, not subscribers) could or would service “subscribers” as claimed. *Id.*

C. Claim 4: The prior art does not suggest downstream data is passed from the first master unit to the daisy chain and upstream data is passed from the daisy chain to the first master unit

Claim 4 requires “downstream data packets received from the network are passed from the first master unit to each of the daisy chains via the first slave unit in each chain, and upstream data packets received by the slaves in each chain from the

subscriber lines are passed via the first slave unit in the chain to the first master unit for transmission over the network.” Downstream packets from the network and upstream packets from the slaves/subscriber lines must thus pass through the first master in opposite directions. POR, 47-50.

Petitioner does not dispute this. Instead, Petitioner argues that “Vink teaches transmitting data in either direction” (Reply, 19), which is different than transmitting upstream and downstream data in opposite directions. For example, if upstream data and downstream data can both be transmitted in one or the other direction, then that data is transmitted in either direction, but the upstream and downstream data are not transmitted in opposite directions. POR, 47-50.

Vink transmits upstream and downstream data in one direction *or* the other—not opposite directions—because it teaches that the sequence of slaves is identical in both the upstream and downstream directions. Ex1005, 6:16-27; POR, 47-50. The Reply does not address this disclosure.

Instead, the Reply argues that “Patrick teaches that data is normally transmitted in the downstream direction from the network down to the slaves via the master and in the upstream direction from the slave to the network via the master.” Reply, 19-20. Even if Patrick taught transmitting upstream and downstream data in different directions, Petitioner has not shown that a POSA would adapt Patrick’s teaching to Vink’s specific topology having two master units. A POSA would

understand that Vink's address system is unidirectional, and the same address would correspond to two different slaves depending on which direction the data is transmitted in. Adapting Patrick to Vink would cause a conflict in the address of each slave.

D. Claim 9: The prior art does not suggest a “switch” or “pre-switch”

1. The prior art does not suggest the claimed “switch”

Claim 9 requires that a switch “route data packets between the respective physical interface and the one or more daisy chains.” The POR showed that Vink's controller selects a destination slave among the slaves in a single chain and does not select among the physical interface and one or more daisy chains as claimed. POR, 50-55. The Reply does not dispute that Vink selects one slave in one chain but argues that PO “misinterprets claim 9.” Reply, 20-22. Because claim 9 recites “one or more daisy chains,” the Reply argues a switch that routes packets to one daisy chain is sufficient to meet claim 9. *Id.* Petitioner misinterprets claim 9.

“Rout[ing] data packets between the respective physical interface and the one or more daisy chains” in claim 9 refers to selecting a destination for a data packet among the physical interface and the one or more daisy chains. For example, if there are two daisy chains A and B, the switch of claim 9 selects among (1) the physical

interface, (2) daisy chain A, and (3) daisy chain B. If there is only one daisy chain, the switch must still select between the physical interface and the one daisy chain.

This interpretation is confirmed by '904 Patent, col. 8 ln. 53 to col. 9 ln. 5:

FIG. 6 ... shows details of active master 30 in normal operation, in accordance with a preferred embodiment[.] Master 30 comprises a main switch 90 and a pre-switch 92. The main switch receives downstream (incoming) packets from the network physical layer interface (NET PHY). The network interface has a switching address 102, corresponding to a switch port no. 5. ... The packets are distributed to chains 36, 37 and 39 at respective addresses 98, 96 and 94 (switch ports 2, 1 and 0). Upstream packets are delivered to address 102 for transmission over the network.

This passage states that, in a downstream packet where the switching address corresponds to the switch port to a slave, the switch of the active master distributes that downstream packet to the switch port for transmission to the slave. But in an upstream packet where the switching address corresponds to the network, the switch of the active master delivers that upstream packet for transmission over the network. Thus, this passage teaches that the switch routes to either the physical interface or the daisy chain and confirms PO's interpretation of claim 9.

The Reply provides no support for its contention that claim 9 is directed to routing a packet to a specific slave within a single daisy chain—nor does the '904

Patent provide such support. Petitioner's assertion that Vink selects one slave in one single chain does not suggest selecting among the physical interface and one or more daisy chains as in claim 9.

2. The prior art does not suggest the claimed "pre-switch"

Claim 9 also requires the pre-switch "re-routes at least a portion of the data packets exchanged with one or more of the slaves in the daisy chain in which the fault has occurred through another one of the daisy chains" "in the event of a fault at a location in one of the daisy chains." The Reply argues that this would have been an obvious modification of Vink in view of Patrick. Reply, 22-25. Patrick allegedly informs a POSA to "utilize[e] more ... branches, segments or sections of any communication medium," and the Reply asserts that this would motivate a POSA to add additional rings to Vink. Reply, 23.

Adding additional rings to Vink, however, is insufficient to arrive at claim 9's invention. Vink discloses that, in the event of a fault, control computer 38 reverses the direction of data flow in its ring configuration. POR, 59-60. Vink does not disclose routing the data through another ring. *Id.* Thus, even if a POSA were to implement Vink with multiple rings, Vink already resolves faults in data flow through its rings by reversing the direction of data flow. There is no rationale for or need to reroute the data flow through another daisy chain when Vink alone already provides a solution for faults. *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688

F.3d 1342, 1369 (Fed. Cir. 2012) (“Because each device independently operates effectively, a person having ordinary skill in the art, who was merely seeking to create a better device to drain fluids from a wound, would have no reason to combine the features of both devices into a single device.”).

E. Claims 6 and 23: The prior art does not suggest “bicast[ing]”

Claims 6 and 23 require the first master unit “bicast” the upstream data packets received from the first slave unit directly to the network and indirectly to the network via the second master unit.

The Reply argues that Vink discloses casting because “data packets are conveyed to the network by Vink’s active master” and bicast because “the passive master transmits upstream packets to the network, after having received them from the active master.” Reply, 25.

The Reply argument is flawed because “bicasting” refers to the active master transmitting the *same* packets to *both* the network and to the passive master (for transmission by the passive master to the network). POR, 55-59. The ’904 Patent repeatedly teaches that both transmissions must occur for bicast:

“[T]he upstream packets are bicast by the active master to *both* the core network and to the standby master. The standby master also transmits the upstream packets to the core network” ’904 patent, 2:23-27.

“[T]he first master unit bicast the upstream data packets that it receives from the slave units to the network *and*, via the protection interface, to the second master unit, which transmits the upstream data packets to the network.” ’904 patent, 3:17-20.

These disclosures confirm that transmitting packets from the first master to the network alone, or transmitting packets from the first master to the second master for transmission to the network alone, is insufficient to meet “bicasting.”

Vink does not disclose “bicasting” because its transmission steps are performed in the alternative—not together. POR, 55-59. In Vink, either the active master conveys the packet, or the passive master “assume[s] the function of the active master in the event of faults” and conveys the packet. *Id.* (citing Ex1005, 16:19-17:2). Vink does not disclose bicasting where the active master both transmits packets to the network and to a passive master for transmission to the network. *Id.* Indeed, the Reply does not argue or cite any teaching to suggest that Vink performs these actions together rather in the alternative.

Instead, the Reply argues that “1+1 APS” as discussed by AAPA renders bicasting obvious in view of Vink: The “Petition explained that if the link between the first master and the network fails, the 1+1 APS fault protection would allow a second separate link from the second master to the network that would allow the copy to reach the network destination.” Reply, 25-28. PO’s expert Mr. Gomez

however explained that “1+1 APS” refers to a general technique of providing two copies of the same transmission. Ex2025, ¶¶103-106. “1+1 APS” does not necessarily require bicasting where a first master transmits packets both to a network and to a second master for transmission to the network. *Id.*

Furthermore, Petitioner’s theory that “1+1 APS” is bicasting is based on a misreading of the ’904 Patent. The ’904 Patent states:

Upstream packets, received by slaves 34 from their respective ports, are passed up the respective chains to active master 30. The active master bicast these packets, sending them both to network 22 and to standby master 32 over a protection interface 76 between the two masters, as indicated by an arrow 77. The standby master also transmits the upstream packets over network 22, as indicated by an arrow 78. This redundancy in transmission is *in accordance with fault protection mechanisms used in high-speed networks known in the art*, such as the standard “1+1 APS” (automatic protection switching) technique used in SONET.”

Ex1001, 8:44-52. This passage merely states that the active master bicast packets by sending packets both to the network and to the standby master, and that this process (“redundancy in transmission”) satisfies existing transmission techniques such as “1+1 APS.” *Id.* It does not teach that bicasting using the active master as disclosed is known in the art or is equivalent to the “1+1 APS” technique. *Id.*

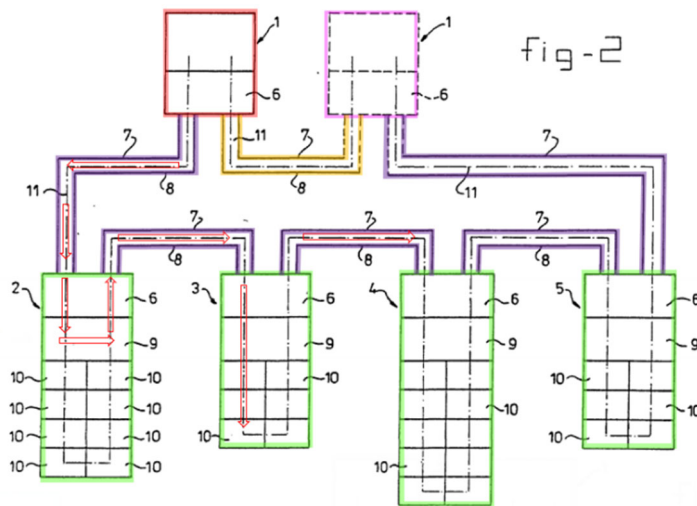
Finally, a POSA would not modify Vink to implement the “1+1 APS” technique. Ex2025, ¶¶103-106. Vink teaches that there is only one active master and, in the event of a fault, a second, passive master assumes the role of the active master. Ex1005, 16:19-17:2. Vink deters bicasting by an active master because only one master conveys packets at a time. POR, 59. The Reply proposes modifying Vink to implement the “1+1 APS” technique but does not explain why a POSA would do so against Vink’s disclosure of only one active master.

F. Claim 17: The petition fails to show how the prior art suggests the pre-switch retains a multicast packet and passes the multicast packet to the second physical interface

The Petition never addressed claim 17’s “multicast packet” or identified where Vink discloses that a packet is both retained by the slave and passed to subsequent slaves. POR, 62. The Reply nonetheless argues that the “illustration provided in the Petition [on page 65]” explains how Vink retains the multicast packet. Reply, 33.

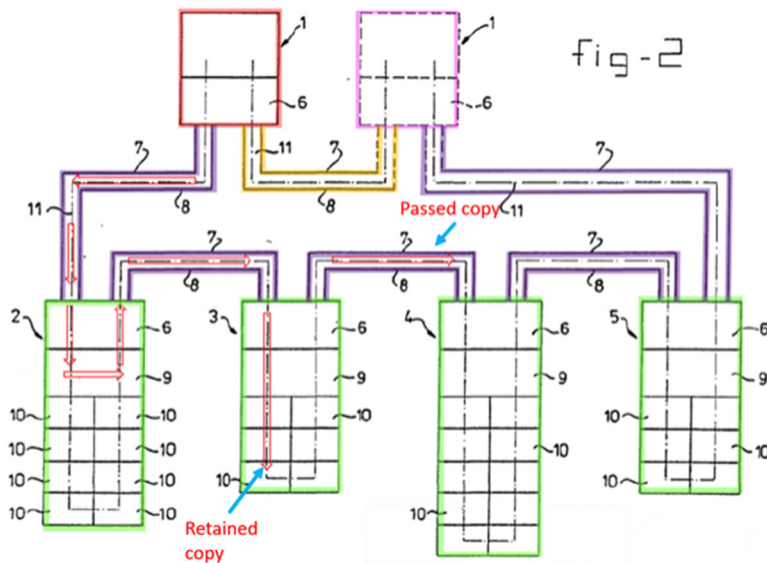
The illustration in the Petition provides no such explanation:

The figure below illustrates how data (in red arrows) intended for one of the I/O modules 10 in slave 3 passes through slave 2 through the transmitting/receiving unit 6 and control module 9 of slave 2, without passing through the I/O modules 10 of slave 2. See Ex-1003, ¶156.



Ex-1005, Figure 2.

Petition, 65. Nothing in the above suggests that copies of the same multicast packet are both retained and passed on. Instead, the Reply contains new annotations for this new theory:



These annotations are a new reply theory that alleges for the first time that one arrow corresponds to a passed copy and another arrow corresponds to a retained copy.

requires Petitioner must identify “with particularity” the grounds of Petitioner’s challenge and the evidence that supports it. 35 U.S.C. § 312(a)(3). This theory was never identified by the Petition and should not be considered. *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016).

Furthermore, the Petition represents that Vink retains “only data packets addressed to the ports (e.g., output 33) of any I/O module 10 of the particular slave, while passing data packets addressed to other slaves onto the other slaves through the next transmission lines 7, 8.” Petition, 62. Retaining only data packets addressed to the ports of a slave while passing on data packets not addressed to the ports of that slave teaches away from a multicast packet. In Vink, data packets are retained if the address matches that of the slave, or passed on if the address does not match that of the slave. POR, 62. This teaching conflicts with a multicast packet that is both retained and passed on if the address matches that of the slave. *Id.*

IV. CONCLUSION

For the foregoing reasons, the Petitioner has failed to show by a preponderance of the evidence that the challenged claims are unpatentable.

Respectfully submitted,

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Date: June 13, 2024

CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITS

This Patent Owner's Sur-Reply (the "Sur-Reply") consists of 5,543 words, excluding table of contents, table of authorities, certificate of service, this certificate, or table of exhibits. The Sur-Reply complies with the type-volume limitation of 5,600 words as mandated in 37 C.F.R. § 42.24. In preparing this certificate, counsel has relied on the word count of the word-processing system used to prepare the paper (Microsoft Word).

Respectfully submitted,

/ Minghui Yang /

Date: June 13, 2024

CERTIFICATE OF SERVICE

The undersigned hereby certifies that, pursuant to 37 CFR § 42.6(e), a true and correct copy of the foregoing **PATENT OWNER'S SUR-REPLY** has been served electronically via email on counsel of record for Petitioner:

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