

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNIFIED PATENTS, LLC,

Petitioner,

v.

OZMO LICENSING LLC,

Patent Owner.

Case No. IPR2023-00193

U.S. Patent No. 9,264,991

PATENT OWNER'S SUR-REPLY

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I. INTRODUCTION

Contrary to Petitioner's false allegations, Paper 23 ("Rep.") at 1, Patent Owner's ("PO") arguments in its Response, Paper 21 ("POR"), conform to the law, do not mischaracterize the Cromer-Ganu combination and the prior art, and account for a POSITA's knowledge and skill. The Board is respectfully requested to duly consider PO's arguments, as summarized below:

1. PO's interpretation of "partially consistent" is based in commonsense.
2. PO did not construe "second network protocol" as an OSI Layer 2 protocol.
3. The Cromer-Ganu combination cannot be consistent with both Cromer and Ganu. If that combination conforms to one, the purpose of the other is destroyed.

II. CLAIM CONSTRUCTION

In the POR, PO stated that the Court has construed "partially consistent" to mean "conforms to a part, but not entirely of" a protocol and that this construction "includes the notion of [] 'rule breaking' or violation" of that protocol. POR at 15 (citing EX1010 at 27-31). Petitioner alleges that this interpretation is superfluous and unsupported by the intrinsic record. See Rep. at 1-6; EX1035, ¶¶4-10.

A. "Partially Consistent" Requires Partial Nonconformance, i.e., Rule Breaking or Violation

The Court construed "partially consistent" as "*conforms to a part, but not*

entirely of” a protocol. See EX1010 at 27-31. The Court accounted for the intrinsic record of the ’991 Patent.

The plain and ordinary, commonsense meaning of a protocol that “conforms to a part [of], *but not entirely*” to another protocol, is at least somewhat inconsistent or nonconformant with that other protocol. The partial inconsistency or nonconformance breaks or violates a rule of that other protocol. Contrary to Petitioner’s erroneous allegation, see Rep. at 5-6; EX1035, ¶4, this interpretation is supported by the intrinsic record. See POR at 15; EX2004, ¶52. Specifically, in an example from the ’991 Patent, a station STA1 communicates with an access point (“AP”) of a primary wireless network (“PWN”)—an IEEE 802.11 Standard (“802.11”) infrastructure-mode network. EX1001, 11:8-21, FIG. 8.

The STA1 is also a COORD, functioning as a coordinator/hub, for a secondary wireless network (“SWN”), that includes three peripherals. *Id.*, 11:21-23, FIG. 8. Thus, the communication between STA1/COORD and AP employs the 802.11 infrastructure-mode protocol, and the communication between STA1/COORD and the peripherals employs an overlay protocol based on the 802.11 infrastructure-mode protocol. See *id.*, 9:52-66.

In the 802.11 protocols, a MAC frame includes a “Power Management” field. EX1029 at 049-050 (§§7.1.2-7.1.3), FIGS. 12-13. Per the 802.11 infrastructure-mode protocol, an AP must always be awake, and cannot enter a

power-save mode. *Id.* at 052 (§7.1.3.1.7) (power management field = 1 indicates “power-save mode” but “is always set to 0 in frames transmitted by an AP”); EX1001, 11:44-46 (“regular STA ... can power down ... unlike an [AP]”). The COORD operates as a hub/AP for the peripherals in the SWN, and yet, can power-down during “mutually aggregable inactivity periods.” *Id.*, 11:47-50. Even when the COORD is powered down, the overlay protocol will not lose peripheral communication. *Id.*

Thus, the overlay protocol violates the 802.11 infrastructure-mode protocol, by allowing the COORD/hub functioning as a WPAN AP to power-down. EX2004, ¶52 (“in a WLAN an infrastructure AP cannot go to sleep ... but in the *WPAN of the invention this rule is violated*”). Thus, Petitioner’s allegation is erroneous. PO’s interpretation of “partially consistent” is based on the Court’s construction and plain and ordinary, commonsense meaning of that construction, and is supported by the intrinsic record.

B. PO Did Not Construe “Second Network Protocol” and Ganu Does Not Disclose this Limitation

1. Ganu Does Not Teach a “Second Network Protocol” for the Cromer-Ganu Combination

Petitioner states that the Board “rejected Ozmo’s implicit claim construction arguments” that the “second network protocol” ought to be “implemented at OSI Layer 2.” Rep. at 2-4; EX1035, ¶6; Paper 10 at 13. PO did not construe the

“second network protocol” as a protocol implemented at Layer 2. See POR at 14-15, 36-39; EX2004, ¶¶92-96. Rather, the OSI layers are discussed in explaining why the Cromer-Ganu combination would fail. See POR at 25 (§V(B)), 36-39 (§V(B)(4)); EX2004 at 30-43 (§IV(B)), 40-42 (§IV(B)(4)).

Cromer describes a client 100 that “uses a Wi-Fi device in ‘infrastructure’ mode” while “communicating in a WLAN environment.” EX1004, 3:19-23, FIG. 1. Therefore, for communicating in the WLAN, the client 100 would use the 802.11 infrastructure-mode protocol. A POSITA would have known that the 802.11 infrastructure-mode protocol is a Layer 2 protocol. See EX1029 at 003, 042-043 (describing that 802.11 protocols at MAC sublayer are Layer 2 protocols); EX2004, ¶92 n.2. A POSITA would also understand that this protocol is the claimed “first network protocol.” See Petition, Paper 1 (“Pet.”) at 47; EX1003, ¶129. In the Cromer-Ganu combination, Petitioner stated that Ganu’s modified protocol would be the claimed “second network protocol.” See Pet. at 47-48; EX1003, ¶¶130-31.

A POSITA would have known that for one protocol to be partially consistent with another, they both must be of the same type. A POSITA would have also known that in the Cromer-Ganu combination, the “first network protocol” (802.11 infrastructure-mode protocol) is a Layer 2 protocol. Therefore, a POSITA would have understood that the “second network protocol” in *the Cromer-Ganu*

combination should also be a Layer 2 protocol. This is what PO argued; PO did not construe the “second network protocol” as implicitly a Layer 2 protocol. Ganu’s modified protocol is an application-level protocol, *i.e.*, a protocol at a higher layer than Layer 2, and hence it cannot be the “second network protocol” in the Cromer-Ganu combination. POR at 36-39; EX2004, ¶¶89-96.

2. ’991 Patent’s Example Describes “Partially Consistent” Layer 2 Protocol

Petitioner alleges that the example from the ’991 Patent cited in the POR “does not reference ‘protocol’ or ‘partially consistent,’” “does not mention or require OSI layers,” and “does not describe achieving those characteristics within OSI Layer 1 or 2 functionality.” Rep. at 2-3, 5-6; *see* EX1035, ¶¶7, 10. These allegations are flawed.

First, this example describes that by “using mutually agreeable inactivity periods,” a COORD can be powered down without losing communication with its peripherals. EX1001, 11:44-50. This example also describes that in the SWN (WPAN), the COORD is functioning as a hub (*e.g.*, AP), and that per the 802.11 Standard, an AP cannot be powered down. *See id.*, 11:21-23, 11:44-50; EX2004, ¶52 (“in a WLAN an infrastructure AP cannot go to sleep ... but in the WPAN of *the invention this rule is violated*”).

As such, in light of the discussion of the overlay protocol in the ’991 Patent,

see EX1001, 9:52-66, a POSITA would have understood that an overlay protocol is used for the SWN and that the overlay protocol breaks a rule of the PWN protocol, that the AP cannot go to sleep. Thus, the overlay protocol of the SWN is only “partially consistent” with the PWN protocol.

Second, regarding the cited example, *see id.*, 11:39-50, a POSITA would have understood, as discussed in the preceding section, that because the PWN protocol (“first network protocol”) is an 802.11 MAC-level protocol (a Layer 2 protocol), the corresponding SWN protocol (“second network protocol”) should also be an 802.11 MAC-level protocol, *i.e.*, a Layer 2 protocol. *See supra* §II(B)(1); EX1029 at 003, 042-043; EX2004, ¶92 n.2; EX1001, 11:8-50, FIG. 8.

Additionally, a POSITA would have understood that the above-described rule breaking by the overlay protocol can be readily implemented in a MAC frame of an 802.11 protocol. Specifically, the “Power Management” field for the COORD can be modified and set to 1, indicating the “power save mode,” even though for the COORD operating as a hub/AP for the WPAN, the field must be set to 0. *See* EX1029 at 049-050 (§§7.1.2-7.1.3), 052 (§7.1.3.1.7). Thus, the cited example discloses a modified 802.11 MAC-level Layer 2 protocol that is partially consistent with and partially inconsistent with the 802.11 protocol.

As such, Petitioner’s allegations above, *see* Rep. at 2-3, 5-6, are incorrect.

3. Ganu Is Different from the '991 Patent's Example, and Fails to Teach "Second Network Protocol"

Petitioner alleges that Ganu's disclosure is similar to the cited example of the '991 Patent, and hence, like the patent, Ganu teaches the "second network protocol." Rep. at 4-6 (alleging further that violations at hub are performed by "logic" and not by protocol); EX1035, ¶¶9-10. These allegations are false.

First, referring to FIG. 6, which "shows various blocks of a wireless *hub*," EX1001, 6:41-43, the '991 Patent states:

The processing unit 28 and memory module 29 are used to implement that portion of the communication protocol that is not implemented in dedicated control and datapath logic; this portion of the communications protocol is referred to as the 802.11x device driver. If the communication protocol between the wireless hub and a PS-STA is modified to reduce power consumption of the PS-STA, the 802.11x device driver may also require slight modification to accommodate such changes.

Id., 7:9-17; *see id.*, 6:19-39, FIG. 5 (disclosing similar structure for PS-STA).

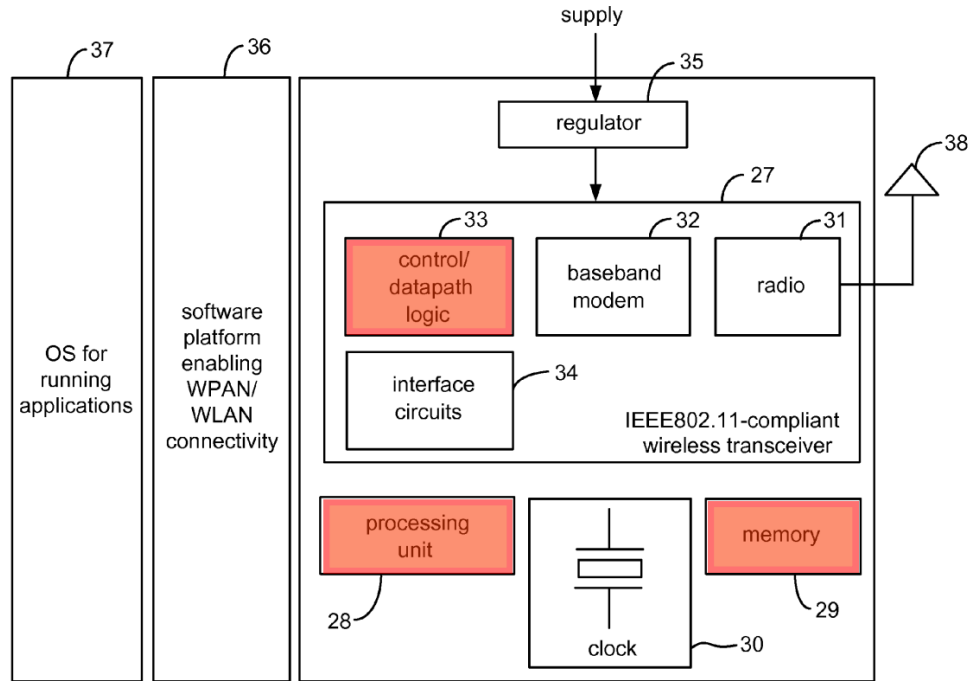


FIG. 6

Id., FIG. 6 (annotated).

Thus, the “logic” to which Petitioner refers includes the “dedicated datapath and control logic” that implements the standard, unmodified portions of the 802.11 protocols. That logic also includes an “802.11x device driver” including a CPU and memory implementing the “modified” portions of the 802.11 protocols. A POSITA would know that these implementations are Layer 2 implementations. *See* EX1029 at 003, 042-043; EX2004, ¶92 n.2.

As described above, these protocol modification include modifying a MAC frame of an 802.11 protocol, by setting the “Power Management” field for the COORD to 1, to indicate the “power save mode” even though the COORD is operating as a hub or an AP for the WPAN. *See supra*, §II(A); EX1029 at 049-050

(§§7.1.2-7.1.3), 052 (§7.1.3.1.7). Thus, contrary to Petitioner’s allegation, the ’991 Patent does disclose a modified 802.11 protocol, *i.e.*, the claimed “second network protocol” at Layer 2.

In contrast, regarding its modifications, Ganu states that “for ease of implementation, the beacons used in the prototype are *application-level* [*i.e.*, at a layer higher than Layer 2] packets, since actual 802.11 beacons are generated by the firmware in most of the existing 802.11b network adapters and are not customizable.” EX1005, p. 882, col. 1. Ganu further states that the application-level implementation resulted in “extremely large discovery times,” and that “using firmware-generated beacons should solve this problem.” *Id.*, p. 884, col. 1. Thus, Ganu, at best, merely contemplates a firmware/Layer 2 implementation of its modified protocol. Neither Ganu nor Petitioner explains how a POSITA would have accomplished such modifications in an 802.11 frame. Accordingly, Petitioner’s allegations, *see* Rep. at 4-6, are false.

In summary, Ganu does nothing more than contemplating an 802.11 protocol, but provides no guidance on how to modify 802.11 frames so that its application-layer modifications can be implemented in 802.11 firmware. Petitioner also does not explain how 802.11 frames can be modified. As such, Ganu does not teach or suggest in a manner understandable by a POSITA, a Layer 2 modified protocol. It should be understood that a “second network protocol” is not

construed to be a Layer 2 protocol. Rather, a POSITA would have understood that when the “first network protocol” is a Layer 2 protocol, as is the case in the proposed Cromer-Ganu combination, the “second network protocol,” should also be a Layer 2 protocol. Ganu does not teach or suggest such a protocol.

Furthermore, the arguments presented below in §§III(B)-(C) are, nevertheless, not based on any OSI layers. Rather, it is shown that Ganu’s teachings are incompatible with Cromer’s. See POR at 29-30, 33-36; EX2004, ¶¶81-86.

III. PO’S PATENTABILITY ARGUMENTS ARE WELL REASONED AND CORRECT

Petitioner states that the Cromer-Ganu combination is well supported, and that a POSITA would have been motivated to make that combination. Rep. at 6-7; EX1035, ¶¶11-12. In particular, Petitioner argues that: (A) Ganu modifies the 802.11 ad-hoc protocol; (B) the Cromer-Ganu combination would have been obvious to a POSITA due to its benefits; and (C) the combination would have been successful. See Rep. at 6-7; EX1035, ¶12. In the discussion below, these arguments are addressed in the order (A), (C), and (B).

A. Ganu Does Not Modify the 802.11 Ad-Hoc Protocol

Petitioner alleges that “Ganu unequivocally modified the 802.11 ad-hoc protocol.” Rep. at 7; EX1035, ¶13; see *generally*, Rep. at 7-10. In support of this allegation, Petitioner states that Ganu uses “augmented 802.11 MAC beacons and

associations” in its implementation. Rep. at 8; EX1035, ¶13. Petitioner concedes that Ganu’s implementation was at the application level, but explains further that Ganu suggested “implementing the discovery protocol in firmware” to improve performance. Rep. at 8; EX1035, ¶13; *see also*, EX1005, p. 884, cols. 1-2.

Petitioner’s argument is wrong, as discussed below.

As a threshold matter, a modification of the 802.11 ad-hoc protocol must be a modification of Layer 2 frames. This requirement stems not from any purported construction of “second network protocol,” *see supra*, §II(B)(1), but from the 802.11 Standard itself. *See* EX1029 at 003, 042-043; EX2004, ¶92 n.2. It is clear that Ganu’s discovery protocol is not a Layer 2 protocol, because Ganu explicitly states that “the beacons used in the prototype are *application-level* packets, since *actual 802.11 beacons* are generated by the firmware in most of the [then] existing 802.11b network adapters and *are not customizable*.” EX1005, p. 882, col. 1; *see* POR at 37-38; EX2004, ¶¶90-93. It is true that Ganu contemplates a Layer 2 discovery protocol, because Ganu states that “using firmware-generated beacons should solve” certain performance issues, and that “implementing the discovery protocol in firmware will result in better network performance.” EX1005, p. 884, cols. 1-2.

Dr. Sharony explained, however, that based on Ganu’s disclosure, a POSITA would have understood that the Tx/Rx Power fields of Ganu’s

application-level discovery protocol can be included as a payload in an 802.11 beacon frame—a type of management frame. POR at 38; EX2004, ¶93; *see* EX1029 at 061 (describing Beacon frame as management frame). Likewise, Ganu’s application-level association message can also be included in the frame body (payload) of a management frame of the type “Association Request.” *See id.* at 062 (describing Association Request frame as management frame). Dr. Sharony also explained that because the standard 802.11 frames allow payloads, *e.g.*, in the frame body, *see id.* at 049 (describing that management frame includes variable-length frame body), these fields would not modify 802.11 frames. POR at 38; EX2004, ¶93.

Thus, if Ganu’s discovery protocol is implemented in the 802.11 firmware, the resulting protocol would not be a modified protocol that is only “partially consistent” and partially inconsistent with the 802.11 infrastructure-mode protocol (“first network protocol”). For this reason, Ganu does not teach or suggest a “second network protocol,” that is an “overlay protocol.” POR at 37-39; EX2004, ¶¶92-95.

Petitioner has not refuted or addressed this analysis. Neither in the discussion of software modifications, *see* EX1035, ¶33, nor elsewhere in his Responsive Declaration, nor during his testimony, does Dr. Haas argue that the inclusion of Tx/Rx Power fields in an 802.11 frame payload would cause the

protocol to be modified. *See generally*, EX1035; EX2006. The words payload or frame body are not even mentioned in Petitioner’s Reply. *See generally*, Rep. Petitioner also does not discuss whether and how Tx/Rx Power fields can be provided in an 802.11 frame other than in the payload. *See generally, id.*; EX1035; EX2006. As such, even if a POSITA had implemented Ganu’s Tx/Rx Power fields in the 802.11 firmware, Ganu does not teach or suggest modifying any 802.11 protocol, including the ad-hoc protocol.

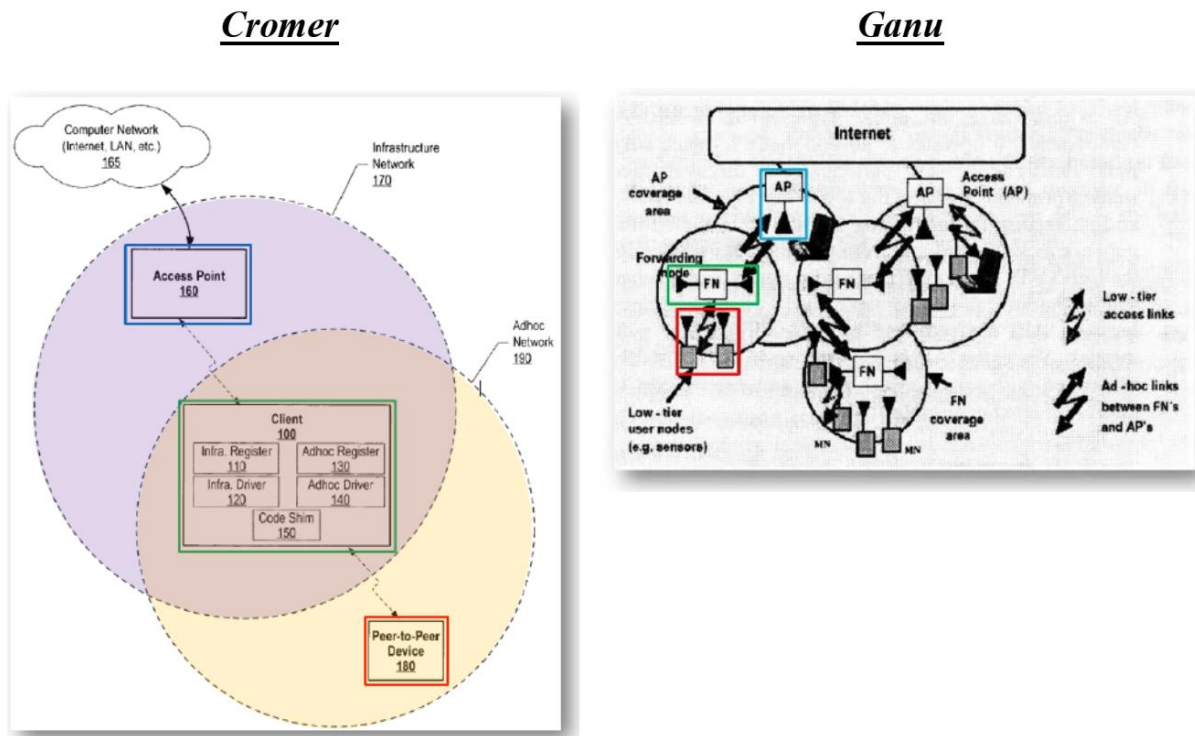
B. Cromer-Ganu Combination Cannot Succeed Because It Cannot Be Consistent with Both Cromer and Ganu

Petitioner argues that the “Cromer-Ganu combination is consistent with the teachings of Ganu,” concluding that Cromer-Ganu combination does not violate Ganu. Rep. at 22-28; EX1035, ¶¶34-41. Petitioner ignores the fact that this combination cannot be consistent with both Cromer’s and Ganu’s teachings. In other words, it violates either Cromer’s or Ganu’s teachings, as Dr. Sharony explained. In particular, he stated that the Cromer-Ganu combination “is entirely inconsistent and incompatible” regarding limitations [1e.2], [1pre], and [1h]. EX2004, ¶87. This is because the Cromer-Ganu combination is incompatible with these limitations, and violates either Ganu’s or Cromer’s teachings, rendering one of them inoperable for its purpose, as discussed below.

Limitation [1e.2], together with the preamble [1pre], recites maintaining *at a*

network-enabled hub, “a first network connection ... and a second network connection.” Limitation [1h] recites “data forwarding logic” at the *network-enabled hub* that forwards data from one node in one network to another node in the other network. EX1001, 14:39-15:3 (Claim 1); see EX1003 at 49-56 (§VII(C)(1)(a)), 75-80 (§VII(C)(1)(f)(ii)), 86-88 (§VII(C)(1)(i)).

Petitioner provided a demonstrative (reproduced below) comparing Cromer and Ganu side-by-side. Rep. at 23; EX1035 at 22.



EX1035 at 22.

Cromer’s client 100 is the alleged “network-enabled hub,” access point (AP) 160 is the alleged node in a first network, and peer-to-peer (P2P) device 180 is the alleged node in the second network. Rep. at 23; Pet. at 21-28, 42-51; EX1003,

¶¶82, 150. Petitioner also states that Cromer’s “client device 100 (network-enabled hub) [] would organize as a forwarding node (FN) following Ganu’s FN teachings.” Pet. at 58; EX1003, ¶148; *see id.*, ¶82. Moreover, Petitioner contends that Ganu’s APs are analogous to Cromer’s APs, and that Ganu’s mobile nodes, MNs, are analogous to Cromer’s P2P devices. *See* Pet. at 21-28, 42-51; EX1003, ¶¶81-85.

At a superficial level, Petitioner’s side-by-side comparison above suggests that Cromer and Ganu are structurally similar, and hence, Ganu’s technique, the discovery protocol in particular, can be employed with Cromer’s system. This superficial comparison fails, however, upon considering the significant, critical differences in operation of Cromer’s and Ganu’s systems, as discussed below.

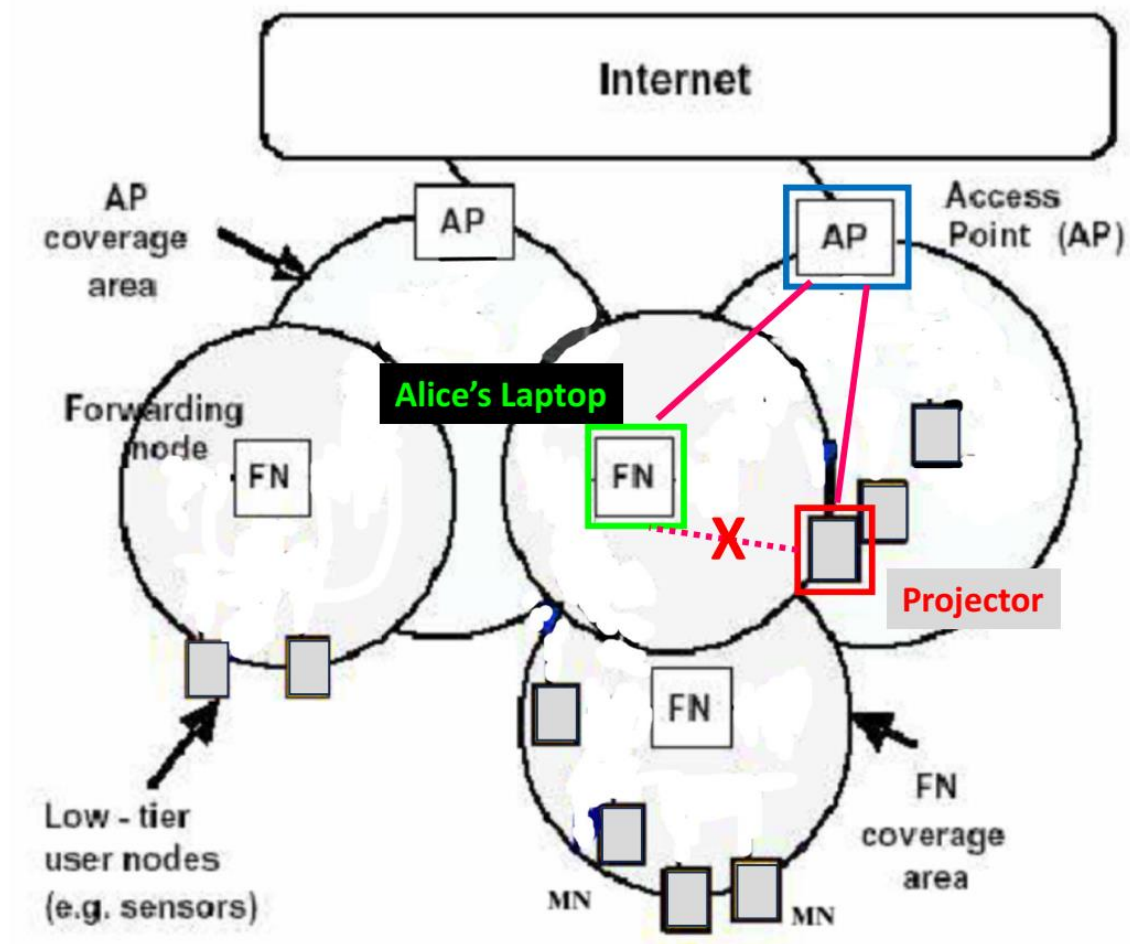
Specifically, in Cromer the client 100 (*e.g.*, a user’s laptop) is in control and chooses a P2P device 180 (*e.g.*, a printer or a projector) to which the client 100 connects. The purpose of this connection by the client 100 is to display or print information on the P2P device. *See* EX1004, 2:2-4 (“the user’s *client* may display a presentation by interfacing to a projector over a WPAN”). To this end, the *client 100 decides* “whether both WLAN and WPAN network connections are *required by the client* (decision 510)” “based upon applications that are being run by a user, such as printing to a WPAN-based printer while connected to an infrastructure WLAN.” *Id.*, 5:38-45. As another example, Cromer states that “a user may travel

to a new worksite and *wish to use a particular overhead projector* that communicates on a WPAN.” *Id.*, 5:2-4. Thus, in Cromer the hub (the client 100) chooses a peripheral (P2P device 180) in the second network.

In the opposite manner, in Ganu, it is the peripheral (MN) that decides to which hub (FN)—or even an AP, bypassing the hub entirely—the MN wishes to connect, so that power usage at the MN can be minimized. EX1005, p. 880, col. 2 (the “MN *attaches itself* to one or more nodes at the higher tiers of the network in order to obtain service using a discovery protocol”). Ganu further discloses that “energy conservation *at the MNs* was chosen as the objective and the discovery metric was based on *minimizing the transmit power consumption at the MNs*.” *Id.*, p. 882, col. 1. Additionally, Ganu states that the MNs “simply forward their data to the *best cost parent selected by the discovery procedure*.” *Id.*, p. 882, col. 2. Thus, in Ganu a MN (a peripheral) uses the discovery protocol to select its parent (*e.g.*, a hub), which can be a “node[] at the higher tiers,” *i.e.*, a FN or an AP.

This is the opposite of what Cromer intends to do. In Cromer, a hub (user’s client, *e.g.*, Alice’s laptop) seeks a connection to a peripheral (a projector). In a Cromer-Ganu combination, based on Ganu’s teachings, even when limited only to modifying Cromer’s ad-hoc network, *see* Rep. at 15; EX1035, ¶23, it would be the peripheral (the projector) that would select a hub that is the “best cost *parent*” that minimizes power consumption at the projector. That parent or hub could be Bob’s

laptop and not Alice's, or could even be an AP. Then the projector would connect directly to the AP or to Bob's laptop, but not to Alice's. This fundamentally and entirely defeats Cromer's purpose, which is to enable a client (e.g., a user's computer) to choose a peripheral (a printer, projector, etc.), and to connect to that chosen peripheral.



EX1005, FIG. 1 (annotated; certain features removed for clarity).

Ganu's original Figure 1 depicts antennas associated with each node, certain additional devices (laptops), and wireless links between various nodes. In the

annotated figure above, those elements are removed for the sake of clarity. An AP, a FN, and a MN are annotated in the same way as Petitioner did in its demonstrative (reproduced above). Ganu's annotated Figure 1 shows that a projector (Cromer's P2P device; Ganu's MN) may have the option of "attaching" itself to Alice's laptop (Cromer's client; Ganu's FN), or directly to the AP. Using Ganu's discovery procedure, the projector may choose to connect to the AP, if that connection would minimize the transmit power consumption at the projector. See *Id.*, p. 882, cols. 1-2.

In that event, Alice's laptop would not connect to the projector, defeating Cromer's purpose. Regarding limitation [1e.2], Alice's laptop (network-enabled hub) cannot "maintain ... a second network connection" to the P2P device, as the latter would disassociate from the former. POR at 31 (describing Petitioner's proposed combination as cherry-picking, and noting that per Ganu's teaching, "MNs [can] 'associate' and 'disassociate' from FNs (and 'APs')"); EX2004, ¶80. Thus, Cromer-Ganu cannot meet limitation [1e.2]. POR at 25-39 (§V(B)), 36; EX2004 at 30-43 (§IV(B)), ¶87.

A POSITA would have readily understood that this fundamental difference between Cromer's operation (where the hub connects to a desired peripheral) and Ganu's operation (where the peripheral selects a suitable hub), makes them incompatible, and that their teachings cannot be combined. In the conjectural

Cromer-Ganu combination, if Cromer's client (hub) forces a connection with a P2P device (peripheral), Ganu's discovery procedure is not employed, which renders the *combination inoperable for Ganu's stated purpose*. See EX2004, ¶¶78-79.

In the alternative, if Cromer's P2P device uses Ganu's modified ad-hoc network and discovery procedure, as Petitioner insists, see Rep. at 15; EX1035, ¶23; EX1003, ¶¶81-89, Cromer's client (hub) cannot connect to a desired P2P device (peripheral), rendering the *combination inoperable for Cromer's intended purpose*. POR at 31 (describing Petitioner's proposed combination as cherry-picking, and noting that per Ganu's teaching, "MNs [can] 'associate' and 'disassociate' from FNs (and 'APs')"); EX2004, ¶80. In summary, a POSITA would have understood that the Cromer-Ganu combination cannot simultaneously be consistent with both Ganu and Cromer, and hence, cannot succeed. Therefore, a POSITA would not have combined Cromer and Ganu.

C. A POSITA Would Not Have Found Cromer-Ganu Combination Obvious Because Purported Benefits Cannot Be Achieved

Petitioner argues that "a POSA would have found the Cromer-Ganu combination obvious." Rep. at 10; EX1035, ¶16. To support this argument, Petitioner alleges that this combination would have resulted in three benefits: (i) power saving, see Rep. at 10-14; EX1035, ¶¶17-21; (ii) facilitation of data

forwarding, *see* Rep. at 14-15; EX1035, ¶¶22-24; and (iii) reduced interference, *see* Rep. at 16-18; EX1035, ¶¶25-26.

As a threshold matter, even if any of these benefits could be achieved, a POSITA would still not combine Cromer and Ganu because the Cromer-Ganu combination renders either: (i) Ganu inoperable (Ganu's discovery procedure cannot be used if Cromer's client/FN selects a P2P device/MN) or (ii) Cromer inoperable (if Ganu's discovery procedure is used, Cromer's client/FN cannot select a P2P device/MN). Therefore, not only would a POSITA not find the Cromer-Ganu combination obvious, but also a POSITA would have understood this combination to be inoperable, and hence, doomed to failure. *See* EX2004, ¶¶78-80. Additionally, none of the benefits that Petitioner identified is achievable in the Cromer-Ganu combination, as explained below.

1. Cromer-Ganu Combination Cannot Yield Power Savings

Petitioner alleges that "power savings over conventional 802.11 ad-hoc networks" can motivate the Cromer-Ganu combination, and that "Ozmo makes no such showing that the Cromer-Ganu combination would not result in power savings." Rep. at 10, 12; EX1035, ¶¶17, 19. Both allegations are false, and are addressed in reverse order.

The POR explained that modifying Cromer's 802.11 beacon frames to include Ganu's Tx/Rx Power fields would cause "performance degradation, due to

higher overhead,” which would reduce any achievable power savings. See POR at 24; EX2004, ¶69. Moreover, the POR explained that the Cromer-Ganu combination “is entirely inconsistent and incompatible” regarding limitations [1e.2], [1pre], and [1h], and hence a POSITA could not implement the combination successfully. POR at 25-39 (§V(B)), 36; EX2004 at 30-43 (§IV(B)), ¶87.

The inconsistency and incompatibility relate to the purported power savings. Specifically, if Ganu’s discovery protocol is applied to Cromer, Cromer’s P2P device (peripheral) can reduce its power consumption, though this power reduction would be offset, to some extent, by the power consumed in processing the Tx/Rx Power fields in the payloads of the beacon frames. But, importantly, this would violate Cromer’s purpose because, in this case, Cromer’s client (hub) cannot connect to a P2P device (peripheral) of the client’s choice. See *supra*, §III(B). Conversely, if Ganu’s discovery protocol is not employed in the Cromer-Ganu combination, Cromer’s client (hub) can connect to a P2P device (peripheral) of the client’s choice, but there would be no power saving without the discovery protocol.

2. Cromer-Ganu Combination Cannot Perform Data Forwarding

Petitioner argues that forwarding techniques were so well-known that in the Cromer-Ganu combination, a POSITA could have successfully modified Cromer’s client 100 to perform data forwarding like that by Ganu’s FN. Rep. at 14-15;

EX1035, ¶¶22-23. Petitioner also states that a POSA would have “adapt[ed] Ganu’s routing tables to account for an infrastructure connection between client 100 and Cromer’s AP.” Rep. at 15; EX1035, ¶23. These arguments are wrong.

In Cromer, a client (hub) seeks to connect to a P2P device (peripheral, a projector, printer, etc.), and establishes an ad-hoc connection with that P2P device. In Ganu, a connection between a MN (peripheral) and a FN (hub) is established in the exact opposite manner to that of Cromer. According to Ganu’s discovery procedure, a particular MN (Cromer’s P2P device) selects one or more FNs or APs (Cromer’s clients or APs) to which that particular MN would connect. *See supra*, §III(B). Because a specific FN (say FN_x) does not choose a particular MN (say MN_p) with which FN_x may connect, FN_x—when not chosen by MN_p—is not configured to forward any traffic at all to/from MN_p.

Thus, in the Cromer-Ganu combination, a conventional data forwarding technique is inapplicable, because FN_x is not even connected to MN_p. Ganu’s data forwarding using Local Neighbor Tables also cannot substitute for a conventional technique, for the same reason—that FN_x is not even connected to MN_p. As such, FN_x (hub) may simply forward the traffic to its neighbor or the next hop, where such traffic may never reach MN_p (peripheral) of interest. *See* POR at 36 (explaining that the Cromer-Ganu combination “is entirely inconsistent and incompatible” regarding limitations [1e.2], [1pre], and [1h] (reciting data

forwarding)); EX2004, ¶87. Thus, neither the conventional data forwarding technique, nor Ganu's data forwarding technique, nor a combination of the two techniques can be employed in the Cromer-Ganu combination.

3. Cromer-Ganu Combination Does Not Reduce Interference

In arguing that the Cromer-Ganu combination reduces interference, Petitioner does not rely on any unique features of Cromer and/or Ganu. *See* Rep. at 16-18; EX1035, ¶¶25-26. Rather, Petitioner argues that the Cromer-Ganu combination avoids interference because Cromer and Ganu both utilize the known common aspects of 802.11, including “operating on different channels” and “CSMA-CA techniques.” Rep. at 17; EX1035, ¶26; EX1003, ¶¶139-144. This is incorrect, as explained below.

The '991 Patent Inventors were familiar with the common interference-reduction techniques of the 802.11 protocols. *See generally*, EX1001. The '991 Patent discloses interference reduction in a situation that would occur in the Cromer-Ganu combination, where a STA in a WLAN functions as a coordinator/hub for a WPAN. In this situation, in the embodiments of the '991 Patent, the coordination of the inactivity periods of a COORD and peripherals avoids communication between these two types of devices when the COORD is inactive. *See id.*, 11:44-50. This can avoid interference with other devices communicating in the infrastructure mode. Petitioner has not described any such

techniques that are not part of the 802.11 Standard and that are employed by the Cromer-Ganu combination. *See* Rep. at 16-17; EX1035, ¶26; EX1003, ¶¶139-144.

Dr. Haas states that it would be obvious “for client device 100 to issue its WPAN beacons at times that minimized interference with AP 160.” EX1003, ¶144. As a threshold matter, neither Cromer nor Ganu contemplates or remotely suggests such coordination between the beacons at a client device. *See generally*, EX1004; EX1005. Moreover, even if a collision and thus the interference between the beacon frames is avoided, the beacon frames from a client can nevertheless interfere with other frames transmitted by the APs, other clients, and the P2P devices in the Cromer-Ganu combination.

Likewise, Ganu’s use of “two radio cards” at a FN, *see* Rep. at 17, can reduce interference at that FN, but may increase it at P2P devices or APs not synchronized with that FN. EX1001, 2:29-36. Cromer and Ganu are silent on such synchronization. *See generally*, EX1004; EX1005. As such, the Cromer-Ganu combination does not reduce interference, and hence, does not disclose the claimed “overlay protocol.”

4. A POSITA Would Have Recognized that the Cromer-Ganu Combination Would Fail

Petitioner argues that a POSITA would have expected this hypothetical combination to succeed, contending that it would have been obvious to implement

Ganu's modification in the 802.11 firmware and to make the necessary software modifications. Rep. at 18-22; EX1035, ¶¶27-33. This is incorrect.

Dr. Sharony explained, however, that based on Ganu's disclosure, a POSITA would have understood that the Tx/Rx Power fields of Ganu's application-level discovery protocol can be included as a payload in an 802.11 beacon frame—a type of management frame. POR at 38; EX2004, ¶93; *see* EX1029 at 061. Likewise, Ganu's application-level association message can also be included in the frame body (payload) of a management frame of the type “Association Request.” *See id.* at 062. Dr. Sharony also explained that because the standard 802.11 frames allow payloads, *e.g.*, in the frame body, *see id.* at 049, these fields would not modify 802.11 frames. POR at 38; EX2004, ¶93.

Thus, if Ganu's Tx/Rx Power fields are implemented in the 802.11 firmware, the resulting protocol would not be a modified protocol that is only “partially consistent” and partially inconsistent with the infrastructure-mode protocol, *i.e.*, the “first network protocol.” For this reason, Ganu does not teach or suggest a “second network protocol” that is an “overlay protocol.” POR at 37-39; EX2004, ¶¶92-95.

Petitioner and/or Dr. Haas have not refuted or addressed Dr. Sharony's conclusion. They have not argued that the inclusion of Tx/Rx Power fields in an 802.11 frame payload would cause the protocol to be modified. *See* Rep. at 18-22;

EX1035, ¶33; *see generally*, Rep.; EX1035; EX2006. Petitioner and/or Dr. Haas also do not discuss whether and how Tx/Rx Power fields can be provided in an 802.11 frame other than in the payload, so as to modify the frame. *See generally*, Rep.; EX1035; EX2006. As such, even if a POSITA had implemented Ganu's Tx/Rx Power fields in the 802.11 firmware, that implementation would not have met the limitations of a "second network protocol" that is an "overlay protocol."

Furthermore, as discussed above, *see supra*, §III(B), a POSITA would have understood that the Cromer-Ganu combination renders either: (i) Ganu inoperable (Ganu's discovery procedure cannot be used if client/FN selects a P2P device/MN) or (ii) Cromer inoperable (if Ganu's discovery procedure is used, client/FN cannot select a P2P device/MN). Therefore, not only would a POSITA not find the Cromer-Ganu combination obvious, but also a POSITA would have understood this combination to be inoperable, and thus destined to fail. *See* EX2004, ¶¶78-80.

IV. CONCLUSION

A POSITA would have understood that Cromer and Ganu cannot be combined as suggested in Ground 1 because the Cromer-Ganu combination violates either Cromer or Ganu. Grounds 2-4 depend on Ground 1, *see* Pet. at 1, and at least for that reason, none of the asserted Grounds renders any claim obvious. As such, it is respectfully submitted that all challenged claims of the '991 Patent are patentable and valid.

Respectfully submitted this 21st day of February, 2024.

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EXHIBIT LIST

Exhibit	Description
2001	Excerpts from: Gast, “802.11® Wireless Networks: The Definitive Guide,” O’Reilly®, April 2002, 2nd Edition.
2002	7/5/2023 Claim Construction Order, <i>Ozmo Licensing LLC v. Dell Technologies Inc. et al.</i> , No. 1:23-cv-00747 (WDTX).
2003	6/28/2023 Markman Transcript, <i>Ozmo Licensing LLC v. Dell Technologies Inc. et al.</i> , No. 1:23-cv-00747 (WDTX).
2004	Sharony Declaration
2005	Sharony CV
2006	9/8/2023 Haas Deposition Transcript
2007	U.S. Patent No. 5,652,751
2008	U.S. Patent Pub. No. 2004/0071123A1
2009	Rao <i>et al.</i> , “An Overlay MAC Layer for 802.11 Networks,” No. UCB/CSD-4-1317, UC Berkeley, April 2004.
2010	Bolin Declaration

CERTIFICATE OF COMPLIANCE

I hereby certify that this *Patent Owner's Sur-Reply* complies with the type-volume limitations of 37 C.F.R. § 42.24(c)(4), because it contains 5,554 words, as calculated by the Microsoft Word program excluding the parts of the brief exempted by 37 C.F.R. § 42.24(c).

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), I hereby certify that on February 21, 2024 the foregoing ***Patent Owner's Sur-Reply*** is being served electronically by agreement of the parties at the following email addresses.

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