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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* GAVRIEL MAGNEZI

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Appeal 2018-008809  
Application 14/496,507  
Technology Center 2600

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Before DAVID M. KOHUT, ERIC B. CHEN, and  
JOSEPH P. LENTIVECH, *Administrative Patent Judges*.

KOHUT, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant appeals from the Examiner's decision to reject claims 1–19 and 30–36.<sup>1</sup> Claims 20–29 have been canceled. Appeal Br. 36 (Claims Appendix). We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM IN PART.

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<sup>1</sup> We use “Appellant” to reference the applicant as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as “Corning Optical Communications Wireless Ltd (formerly ‘Corning MobileAccess Ltd’).” Appeal Br. 2.

STATEMENT OF THE CASE

APPELLANT’S INVENTION

Appellant’s invention relates to “distribution of communications signals in a distributed antenna system (DAS), and more particularly to supporting analog remote antenna units (RAUs) in digital DASs using analog RAU digital adaptors.” Spec. ¶ 1. Claim 1 recites the invention as follows (formatting added):

1. An adaptive analog remote unit for a digital distributed antenna system (DAS), comprising:

at least one analog remote antenna unit (RAU) configured to:

receive at least one uplink analog radio frequency (RF) communications signal from at least one client device;  
and

convert the at least one uplink analog RF communications signal into at least one uplink analog optical communications signal;

at least one analog RAU digital adaptor coupled to the at least one analog RAU over at least one uplink optical fiber;

wherein

the at least one analog RAU is configured to provide the at least one uplink analog optical communications signal to the at least one analog RAU digital adaptor; and

the at least one analog RAU digital adaptor [is] configured to:

receive the at least one uplink analog optical communications signal from the at least one analog RAU over the at least one uplink optical fiber; and

convert the at least one uplink analog optical communications signal into at least one uplink digital communications signal; and

distribute the at least one uplink digital communications signal over at least one uplink communications medium to a digital head-end equipment (HEE) in the digital DAS.

Appeal Br. 29 (Claims Appendix).

#### REJECTIONS

1. Claims 1–3, 6–9, and 32,<sup>2</sup> stand rejected under 35 U.S.C. § 103 as unpatentable over Uyehara et al. (US 2012/0177026 A1; published July 12, 2012, hereinafter “Uyehara”) and Oh et al. (US 7,286,507 B1; issued Oct. 23, 2007, hereinafter “Oh”). Final Act. 5–9.

2. Claims 4, 5, 10, and 11 stand rejected under 35 U.S.C. § 103 as unpatentable over Uyehara, Oh, and Kroener (US 2009/0180423 A1; published July 16, 2009). Final Act. 9–10.

3. Claims 14, 18, 31, and 33–36 stand rejected under 35 U.S.C. § 103 as unpatentable over Uyehara, Oh, and Official Notice.<sup>3</sup> Final Act. 10–14, and 17.<sup>4</sup>

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<sup>2</sup> The Final Action omits claim 32 from the statement of this rejection (Final Act. 5), but addresses claim 32 in the details of this rejection (*id.* at 9). The Final Action includes claims 31 and 33–36 in the statement of this rejection (*id.* at 5), but addresses these claims in the details of only another rejection applying Uyehara, Oh, and Official Notice (*id.* at 10–14). We accordingly interpret claims 31–36 to be rejected as shown above.

<sup>3</sup> The Final Action lacks a statement of rejection for claim 18.

<sup>4</sup> The Examiner applies different official notice to each of claims 14, 18, 31, and 33–36. Final Act. 10–14, and 17.

4. Claims 12, 13, and 15 stand rejected under 35 U.S.C. § 103 as unpatentable over Uyehara, Oh, and Kawasaki (US 2014/0204900 A1; published July 24, 2014). Final Act. 14–17.

5. Claims 16, 17, and 19, stand rejected under 35 U.S.C. § 103 as unpatentable over Uyehara, Oh, Kawasaki, and Official Notice. Final Act. 17.<sup>5,6</sup>

6. Claim 30 stands rejected under 35 U.S.C. § 103 as unpatentable over Uyehara, Oh, and Imajo (US 6,337,754 B1; issued Jan. 8, 2002). Final Act. 17–18.

## OPINION

### 1. REJECTION OF CLAIMS 1–3, 6–9, AND 32 OVER UYEHARA AND OH

#### *Claims 1–3 and 32*

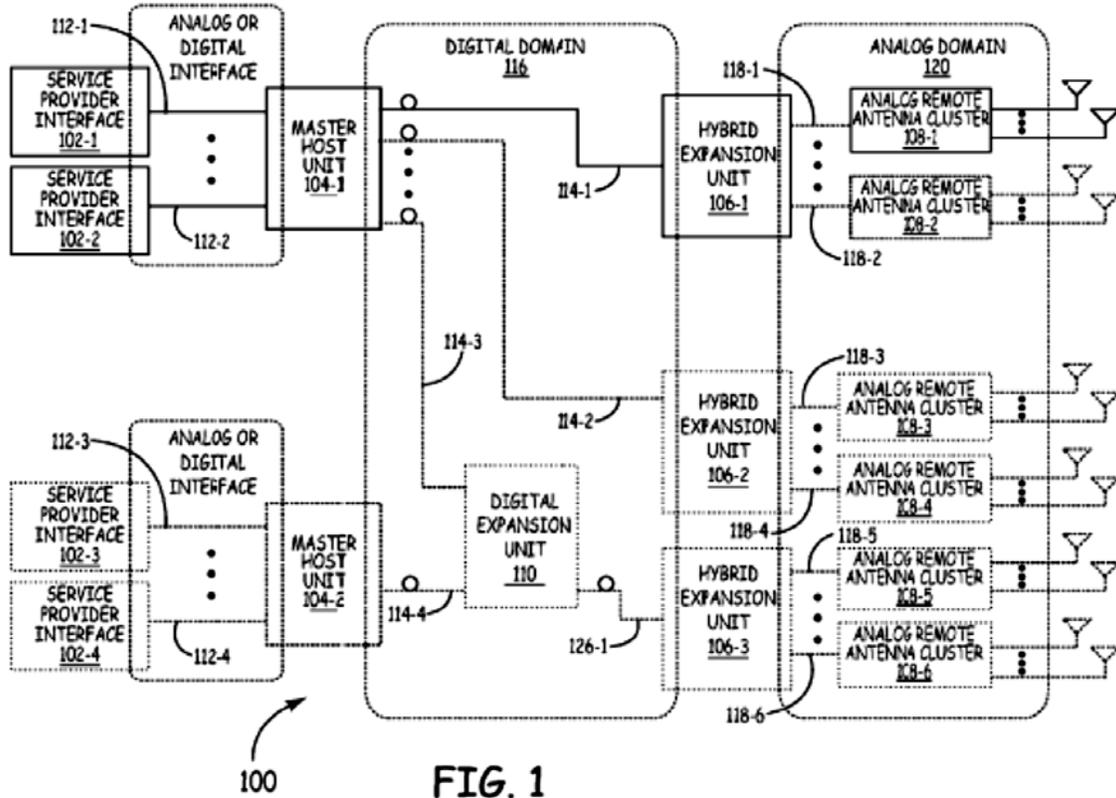
We are unpersuaded of error in this rejection of independent claim 1. For the same reasons, we are unpersuaded of error in this rejection of claims 2, 3, and 32, which are not separately argued with particularity and depend from claim 1.

The rejection of claim 1 primarily relies on Uyehara’s Figure 1, which is reproduced below (next page) and illustrates a block diagram of Uyehara’s DAS (Uyehara ¶ 13). *See* Final Act. 5–6. Per the applied features, a communication is uploaded from the analog domain 120 of an analog remote antenna cluster (ARAC) 108 to the digital domain 116 of a master host unit (MHU) 104. *See* Final Act. 5–6; *see also* Uyehara ¶¶ 3, 19, and Abstract. The ARAC 108—and, more specifically, a therein

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<sup>5</sup> The Final Action lacks a statement of rejection for claims 16, 17, and 19.

<sup>6</sup> The Examiner applies the same official notice to each of claims 16, 17, and 19. *Id.* at 17.



“FIG. 1 is a block diagram of . . . a system for providing wireless coverage into a substantially enclosed environment.”  
 Uyehara ¶ 4.

integrally-formed pair of master and slave analog remote antenna units 402, 404—receives a radio frequency (RF) signal from an antenna of the slave unit 404. Final Act. 5; *see also* Uyehara ¶¶ 60–62. The ARAC 108 outputs a corresponding analog optical signal to a hybrid expansion unit (HEU) 106 via an analog communication link 118. Final Act. 5; *see also* Uyehara ¶¶ 19, 28, 31–32, and 61. The HEU 106 outputs a corresponding signal to the MHU 104 via a digital communication link 114. Final Act. 5–6; *see also* Uyehara ¶¶ 19–20, 28–30, 45, 52, and 81.

The Examiner reads all but the claimed client on Uyehara’s above features. Final Act. 6. Specifically, the claimed analog RAU, digital

adaptor, and digital HEE are respectively read on Uyehara’s ARAC 108, HEU 106, and MHU 104. *Id.* The claimed analog RF signal, analog optical signal, and digital signal are respectively read on Uyehara’s RF signal input by a slave analog remote antenna unit 404, analog optical signal output by an ARAC 108 to an HEU 106 via link 118, and digital signal output by the HEU 106 to an MHU 104 via link 114. *Id.*

Turning to the arguments, Appellant contends the claimed invention as a whole—i.e., the “*adaptive* analog remote unit” of the preamble—is a singular device comprising the RAU and digital adaptor, whereas Uyehara’s ARAC 108 and HEU 106 do not comprise a singular device. Appeal Br. 11–15; *see also* Reply Br. 3–6. Appellant further contends the claimed invention is accordingly an analog RAU device but advantageously includes a digital interface (the digital adaptor) for connecting to a digital DAS; e.g., such that the claimed invention, unlike a device that is fully digital or analog, can connect analog client devices to a digital DAS. Appeal Br. 11–12, 14–15; *see also* Reply Br. 5–6. We are unpersuaded of error for each of two reasons.

First, we are unpersuaded that the claim’s preamble language, “unit comprising,” would be understood as limiting the invention to the argued structure—that is, as limiting the invention to a *singular device* comprising the RAU and digital adaptor. A preamble operates as such a limitation if reciting structure is underscored by the Specification. *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1257 (Fed. Cir. 1989) (the claim’s preamble language, “[a]n optical waveguide comprising,” was restrictive because the Specification defined an “optical waveguide” and described the invention as being directed to the defined structure). Here,

Appellant’s Specification does not underscore the argued structure, but rather the function of the claimed digital adaptor. Spec. ¶¶ 1, 6, and 14–21 (Title). For example, the first paragraph of the invention’s summary underscores “communicative[] coupl[ing]” of a digital adaptor to both an analog RAU and digital DAS, such that the digital adaptor provides an “interface for” the analog RAU to “compatibly communicate with” the digital DAS. Spec. ¶ 6. These underscored features are not derived from placing the digital adaptor and analog RAU within a same device.

Second, even assuming the claimed invention integrates the digital adaptor and RAU within a singular device, Appellant does not persuasively rebut the Examiner’s finding that it would have been obvious to likewise integrate Uyehara’s HEU 106 and ARAC 108 within a singular device. Final Act. 2; *see also* Ans. 18. The Examiner particularly finds that “[m]aking integral what had been made in two separate units is merely a matter of obvious engineering choice (*In re Larson*, 340 F.2d 965, 968 . . . (CCPA 1965)[;] MPEP 2144.04[.]V.B.)” and integrating Uyehara’s ARAC 108 and HEU 106 into one device would, accordingly, have been obvious. Final Act. 2; *see also* Ans. 18. Appellant addresses the Examiner’s reliance on *Larson*, but does not rebut that it is *prima facie* obvious to include sequentially-coupled devices—such as the HEU 106 and ARAC 108—within one device. Appeal Br. 13–14; *see also* Reply Br. 6–7; *see also KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007) (It is obvious to integrate two elements into one device if “[t]he two in combination [do] no more than they would in separate, sequential operation.”) (citing *Anderson’s–Black Rock, Inc. v. Pavement Salvage Co.*,

396 U.S. 57, 62 (1969)).<sup>7</sup> Appellant also alleges a “new device” (Appeal Br. 14) and “benefits” (*id.* at 15) would arise from integrating the HEU 106 and ARAC 108 into one device, but does not *show* these results would have constituted unexpected results. *See In re Geisler*, 116 F.3d 1465, 1471 (Fed. Cir. 1997) (“[N]aked attorney argument is insufficient to establish unexpected results.”) (citations and quotations omitted).

Appellant also contends the Examiner has not shown Uyehara’s ARAC 108 converts an uplink analog RF signal into an analog optical signal (as does the claimed RAU). Appeal Br. 15–18; *see also* Reply Br. 8–10. We are unpersuaded of error because the Examiner has shown the ARAC 108 inputs RF signals and outputs corresponding signals to the HEU 106 via a direct analog link 118 of optical fibers. Final Act. 5 (citing Uyehara ¶¶ 61, 77–78); *see also* Ans. 20 (citing Uyehara ¶ 60). An ordinarily skilled artisan would infer that, if the analog link 118 is a *direct fiber-optic link* between the ARAC 108 and HEU 106, the ARAC 108 converts the input analog RF signal into an analog optical signal directly output to the HEU 106. *See KSR*, 550 U.S. at 418 (“[Obviousness] analysis . . . can take account of the inferences . . . a person of ordinary skill in the art

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<sup>7</sup> Several teachings of Uyehara support the proposed integrating of an HEU 106 and ARAC 108 into one device. First, Uyehara teaches an HEU 106 can serve only one ARAC 108. *See* Uyehara ¶ 60. Second, Uyehara teaches the HEU 106 as merely interfacing the ARAC 108 and MHU 104, which indicates the HEU 106 need not be separately disposed for another purpose. *See e.g., id.* ¶ 3. Third, Uyehara teaches general advantages of integrating two sequentially-coupled electronic devices into one device. *See id.* ¶ 79 (“[R]edundant functions in the [integrated] master analog remote antenna unit 402 and [] slave analog remote antenna unit 404–1 may be removed[; e.g.,] the two units may share the same controller and power supply.”).

would employ.”).

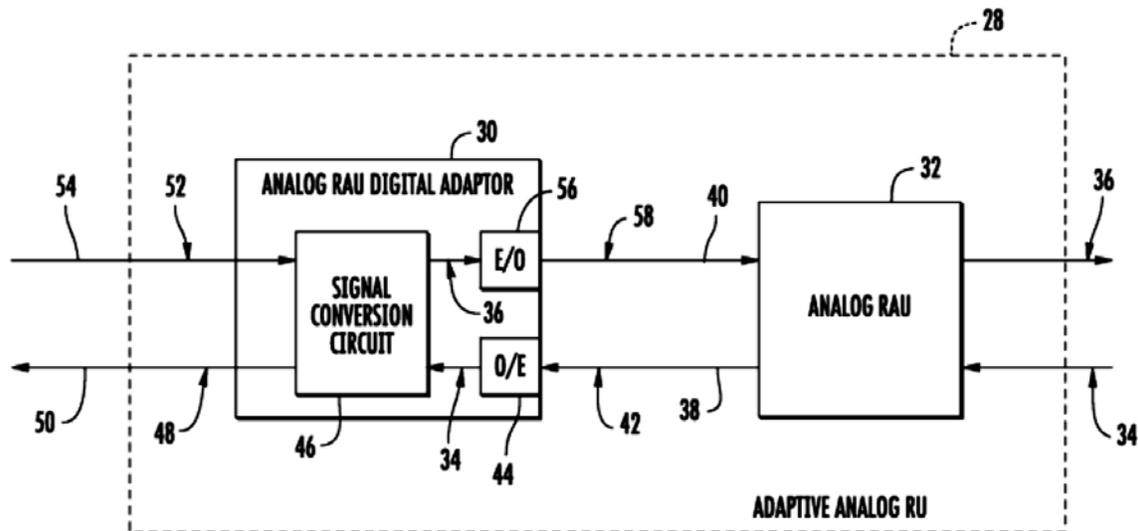
*Claims 6–9*

For the reasons below, we are persuaded of error in this rejection of independent claim 6. For the same reasons, we are persuaded of error in this rejection of claims 7–9, which depend from claim 6.

Appellant contends “[c]laim 6 . . . includes limitations similar to those in claim 1” but additionally recites “two separate ‘converting’ steps[—]one to convert ‘the . . . uplink analog optical . . . signal back into the . . . uplink analog RF . . . signal,’ and one to convert ‘the . . . uplink analog RF . . . signal into [the] uplink digital . . . signal.’” Appeal Br. 6. Appellant further contends the Examiner “has not pointed with particularity to anything in Uyehara that corresponds to the two claimed converting steps.”

*Id.* at 19. The above operations are shown by Appellant’s Figure 2, which is reproduced below and illustrates a conversion of analog RF signals into digital signals. Spec. ¶ 14. The conversion includes: an analog RAU 32 converting an analog RF signal 34 into an analog optical signal 42; a digital adaptor 30 converting the analog optical signal 42 *back into* an analog RF signal 34; and the adaptor 30 converting the analog RF signal 34 into a digital signal 48. Spec. ¶ 27.

We are persuaded of error inasmuch as the Examiner does not address the above “back into” step whereby, after an analog RF signal is converted into an analog optical signal, the signal is converted *back into* an analog



**FIG. 2**

“FIG. 2 is a schematic diagram of an exemplary adaptive analog remote unit having an analog remote antenna unit (RAU) digital adaptor configured to interface an analog RAU with the digital DAS . . . by providing conversions between digital radio frequency (RF) communications signals and analog RF communications signals.” Spec. ¶ 14.

RF signal (for conversion to a digital signal). In the Final Action, the Examiner merely states “[c]laim 6 is interpreted and rejected as claim 1”

(Final Act. 6) because claim 1’s converting of an optical analog signal into an RF digital signal “implies” claim 6’s above two steps. *Id.* at 4. In the Answer, the Examiner merely states “[i]t logically follows [claim 6’s two] steps have to be performed” in an instance of “convert[ing] an electrical/RF signal to an optical signal.” Ans. 22. These statements constitute unsupported official notice for esoteric technical reasoning—namely for the Examiner’s postulation that, as part of converting an analog optical signal to a digital signal, the optical signal would be first converted to an analog electrical signal. Even assuming the Examiner is correct, we cannot accept such official notice if contested and not explicitly supported. *See In re Beasley*, 117 Fed.Appx. 739, 743–44 (Fed. Cir. 2004) (not selected for publication in the Federal Reporter); *see also Manual of Patent Examining Procedure* § 2144.03, “Reliance on Common Knowledge in the Art or ‘Well Known’ Prior Art” (9th ed., rev. 8, 2018) (quoted, with approval, by *Beasley*).

2. REJECTION OF CLAIMS 4, 5, 10, AND 11  
OVER UYEHARA, OH, AND KROENER

*Claims 4 and 5*

For the reasons below, we are unpersuaded of error in this rejection of claims 4 and 5, which depend from claim 1. Claims 4 and 5 are identical, except for respectively describing uplink and downlink digital signals. We therefore address claim 4 as representative. *Accord* Appeal Br. 20. Claim 4 recites, *inter alia*, “wherein the . . . uplink digital communications signal carries data packets conforming to a common public radio interface (CPRI) packet format.”

In addressing this limitation, the Examiner finds “Kroener teaches

. . . a network where data is transferred between the first unit and the second unit via . . . common public radio interface (CPRI) data [that] is transferred as Ethernet packets.” Final Act. 10 (citing Kroener Abstract, Fig. 1). In view thereof, the Examiner determines “it would have been obvious . . . to apply [this communication] method of Kroener in the modified network of Uyehara [so as] to preclude the transmission of manufacturer-dependent information.” *Id.* The Examiner also requests Appellant “to provide a sensible reason” why an ordinarily-skilled artisan would not “use the well-known **common public radio interface** (CPRI) format[,] taught in Kroener, in a network whose primary role is to receive and transmit **radio** signals.”

Ans. 23.

Appellant contends:

Kroener only discloses transferring CPRI data as Ethernet packets within two units of a base station. *See Kroener*, Abstract and Figure 1. Kroener [therefore] does not disclose that “at least one ***uplink digital communications signal*** carries data packets conforming to a common public radio interface (CPRI) packet format . . . or an Ethernet packet format,” as recited in claim 4.

Appeal Br. 20.

In the Reply Brief, Appellant repeats the contentions of the Appeal Brief, thus neglecting the Examiner’s above request. Reply Br. 11–12.

We are unpersuaded of error because Appellant merely contends a communication within a base station (Kroener’s cited communication) is different than a communication between Uyehara’s HEU 106 and MHU 104. App. Br. 20; Reply Br. 11–12. Even assuming that is correct, Appellant does not explain the difference, much less show a material difference. We are, therefore, apprised of only a material similarity—namely that Kroener’s

and Uyehara’s cited communications are both radio communications (and CPRI is a radio communication format).<sup>8</sup>

*Claims 10 and 11*

Because claims 10 and 11 depend from claim 6, we are persuaded of error in this rejection of claims 10 and 11 for the same reasons indicated above with respect to claim 6.

3. REJECTION OF CLAIMS 14, 31, AND 33–36  
OVER UYEHARA, OH, AND OFFICIAL NOTICE

*Claim 14*

Because claim 14 depends from claim 6, we are persuaded of error in this rejection of claim 14 for the same reasons indicated above with respect to claim 6.

*Claims 31 and 33–36*

For the reasons below, we are persuaded of error in this rejection of claims 31 and 33–36. Specifically, we are persuaded by Appellant’s contentions that the Examiner presents improper official notice for claims 31 and 33–36. Appeal Br. 21–24; *see also* Reply Br. 12.

The Examiner presents respective official notice for each claim, stating: “Official Notice is taken that HEE and RAU digital adaptor are known in the art to comprise the components set forth in the claim” with

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<sup>8</sup> A further similarity is that both communications are configured to minimize information loss over large distances. *See* Uyehara ¶ 30 (“By using digital transport over . . . link 114, the bands of RF spectrum . . . can be transported over long distances with minimal errors.”); *see also* Kroener ¶ 14 (“[T]he first unit may be connected to the Ethernet switch by . . . an optical transmission[, which] is particularly suitable for spanning large distances.”).

respect to claim 31 (Final Act. 12); and “Official Notice is taken the RAU digital adaptor is known in the art to comprise the components set forth in the claim” with respect to each of claims 33–36. *Id.* at 12–13. These statements constitute unsupported official notice for esoteric technical reasoning—namely for the Examiner’s postulation that the features of claims 31 and 33–36 were all known in the art. As previously explained for claim 6, we cannot accept such official notice if contested and not explicitly supported.

4. REJECTION OF CLAIMS 12, 13, AND 15 OVER  
UYEHARA, OH, AND KAWASAKI

Because claims 12, 13, and 15 depend from claim 6, we are persuaded of error in this rejection of claims 12, 13, and 15 for the same reasons indicated above with respect to claim 6.

5. REJECTION OF CLAIM 18 OVER UYEHARA, OH, KAWASAKI,  
AND OFFICIAL NOTICE

Because claim 18 depends from claim 6, we are persuaded of error in this rejection of claim 18 for the same reasons indicated above with respect to claim 6.

6. REJECTION OF CLAIM 30 OVER UYEHARA, OH, AND IMAJO

Because claim 30 is not separately argued and depends from claim 1, we are unpersuaded of error in this rejection of claim 30 for the same reasons indicated above with respect to claim 1. Appeal Br. 27.

### CONCLUSION

We affirm the Examiner’s rejections of claims 1–5, 30, and 32 under 35 U.S.C. § 103.

We reverse the Examiner’s rejection of claims 6–9, 10–19, 31, and 33–36 under 35 U.S.C. § 103.

### DECISION SUMMARY

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1–3, 6–9, 32	103	Uyehara, Oh	1–3, 32	6–9
4, 5, 10, 11	103	Uyehara, Oh, Kroener	4, 5	10, 11
14, 18, 31, 33–36	103	Uyehara, Oh, Official Notice		14, 18, 31, 33–36
12, 13, 15	103	Uyehara, Oh, Kawasaki		12, 13, 15
16, 17, 19	103	Uyehara, Oh, Kawasaki, Official Notice		16, 17, 19
30	103	Uyehara, Oh, Imajo	30	
<b>Overall Outcome</b>			1–5, 30, 32	6–9, 10–19, 31, 33–36

### TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED IN PART