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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* THORSTEN CLEVORN, PABLO HERRERO,  
URI PERLMUTTER, and RONEN KRONFELD

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Appeal 2019-002977  
Application 15/137,021<sup>1</sup>  
Technology Center 2600

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Before JASON J. CHUNG, JAMES W. DEJMEK, and  
MATTHEW J. McNEILL, *Administrative Patent Judges*.

DEJMEK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant<sup>2</sup> appeals under 35 U.S.C. § 134(a) from a Final Rejection of claims 40–59. Appellant has canceled claims 1–39. Appeal Br. 4. We have jurisdiction over the remaining pending claims under 35 U.S.C. § 6(b).

We affirm.

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<sup>1</sup> According to Appellant, this application is related to Application No. 14/062,982, which is currently on appeal (Appeal No. 2019-002933) before the Board. Appeal Br. 3.

<sup>2</sup> Throughout this Decision, we use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42 (2018). Appellant identifies Intel IP Corporation as the real party in interest. Appeal Br. 2.

## STATEMENT OF THE CASE

### *Introduction*

Appellant's disclosed and claimed invention generally relates to "communication devices and methods for performing radio communication." Spec. ¶ 2. More specifically, Appellant notes in the Specification that mobile devices may support various radio access technologies ("RATs") such as WLAN (Wireless Local Area Network), UMTS (Universal Mobile Telecommunication System), and LTE (Long Term Evolution), and that the different RATs may require different or multiple antennas. Spec. ¶ 3. In a disclosed embodiment, a communication device is provided wherein "one or more antennas may be shared between RATs (which each request multiple antennas) by switching it [(i.e., the shared antenna(s))] between the RATs in a controlled manner." Spec. ¶ 12.

Figure 8 is illustrative and is reproduced below:

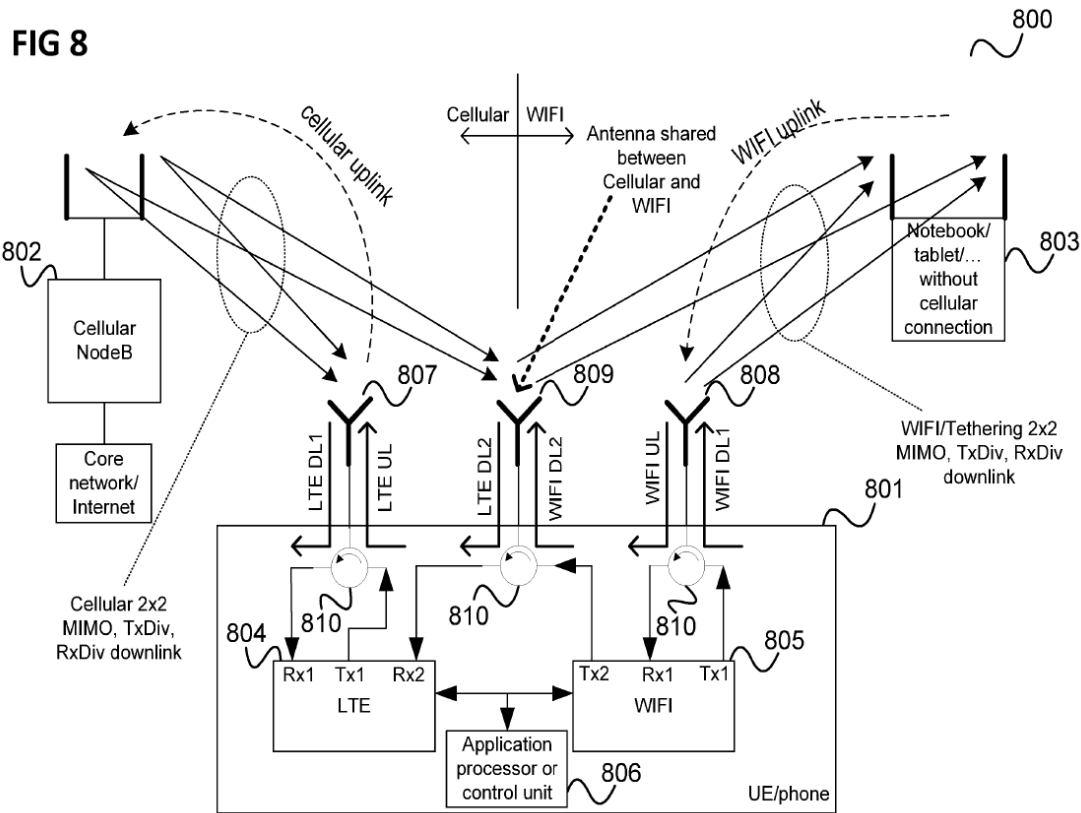


Figure 8 shows a communication arrangement of a communication device (801) in a tethering scenario. Spec. ¶ 5; *see also* Spec. ¶¶ 100–109. As shown, the communication device (801) comprises an LTE transceiver (804) coupled to a first antenna (807) via circulator (810), a WiFi transceiver (805) coupled to a second antenna (808) via circulator (810), and a control unit (806) that can further couple the LTE transceiver (804) and WiFi transceiver (805) to a third antenna (809) via circulator (810). Spec. ¶¶ 100–109. The Specification describes the particular arrangement illustrated in Figure 8 as “a high-speed tethering scenario” in which the communication device (801) serves as an access point for a further device (803) to connect to the Internet via base station (802). Spec. ¶ 103. The Specification further

explains that the “antenna transmission and reception signals may be separated by means of circulators 810.” Spec. ¶ 109.

Claims 40, 44, 49, 53, 58, and 59 are independent claims. Claim 40 is representative of the subject matter on appeal (*see* Appeal Br. 14 n.2; *see also* 37 C.F.R. § 41.37(c)(1)(iv)) and is reproduced below with the disputed limitation emphasized in *italics*:

40. A communication device comprising:

at least one first antenna, at least one second antenna and at least one third antenna;

a long term evolution (LTE) transceiver configured to control the at least one first antenna for communication with one or more other communication devices;

a wireless local area network (WLAN) transceiver configured to control the at least one second antenna for communication with the one or more other communication devices;

a controller configured to determine a communication link between the at least one third antenna and the LTE transceiver or the WLAN transceiver based on a priority of the communication of the LTE transceiver and a priority of the communication of the WLAN transceiver;

wherein the controller is further configured to control the LTE transceiver for communication with the one or more other communication devices using the at least one first antenna and the at least one third antenna when the controller determines the communication link between the at least one third antenna and the LTE transceiver; and

wherein the controller is further configured to control the WLAN transceiver for communication with the one or more other communication devices using the at least one second antenna and the at least one third antenna when the controller determines the communication link between the at least one third antenna and the WLAN transceiver; and

*wherein the controller is further configured to determine that the at least one third antenna is to be used by the LTE transceiver as an LTE downlink connection receive antenna, and wherein the controller is further configured to determine that the at least one third antenna is to be concurrently used by the WLAN transceiver as a WLAN connection transmit antenna.*

### *The Examiner's Rejections*

1. Claims 40–59 stand provisionally rejected under the doctrine of obviousness-type double patenting over claims 22–30 and 40–42 of U.S. Application No. 14/062,982 (filed October 25, 2013). Final Act. 4–6.

2. Claims 40–59 stand rejected under 35 U.S.C. § 103 as being unpatentable over Mantravadi et al. (US 2014/0273884 A1; Sept. 18, 2014) (“Mantravadi”) and Gans et al. (US 5,854,611; Dec. 29, 1998) (“Gans”). Final Act. 6–13.

### ANALYSIS<sup>3</sup>

#### *Provisional Obviousness-type Double Patenting Rejection*

Appellant does not respond to the Examiner’s provisional rejection of claims 40–59 under the doctrine of obviousness-type double patenting. *See* Appeal Br. 12 (identifying the Examiner’s rejection of claims 40–59 under 35 U.S.C. § 103 as the only ground of rejection to be reviewed on appeal). Subsequent to the Examiner’s Final Rejection, Appellant requested that the

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<sup>3</sup> Throughout this Decision, we have considered the Appeal Brief, filed September 28, 2018 (“Appeal Br.”); the Reply Brief, filed March 4, 2019 (“Reply Br.”); the Examiner’s Answer, mailed January 24, 2019 (“Ans.”); and the Final Office Action, mailed February 23, 2018 (“Final Act.”), from which this Appeal is taken.

Examiner “hold the provisional double patenting rejection in abeyance.”  
Response After Final 11 (filed May 23, 2018).

Because the rejection is still maintained (i.e., the Examiner has not withdrawn the rejection), it is still properly before the Board. Appellant has not filed a Terminal Disclaimer.

To the extent Appellant has not advanced separate, substantive arguments for particular claims or issues, such arguments are considered waived. *See* 37 C.F.R. § 41.37(c)(1)(iv); *see also Hyatt v. Dudas*, 551 F.3d 1307, 1314 (Fed. Cir. 2008) (“When the appellant fails to contest a ground of rejection to the Board, . . . the Board may treat any argument with respect to that ground of rejection as waived.”). Additionally, “[i]f a ground of rejection stated by the examiner is not addressed in the appellant’s brief, appellant has waived any challenge to that ground of rejection and the Board may summarily sustain it unless the examiner subsequently withdrew the rejection in the examiner’s answer.” Manual of Patent Examining Procedure (“MPEP”) § 1205.02 (9th ed., Rev. 10.2019, June 2020).

Accordingly, we summarily sustain the Examiner’s provisional rejection of claims 40–59 under the doctrine of obviousness-type double patenting.

*Rejection under 35 U.S.C. § 103*

Appellant disputes the Examiner’s finding that the prior art, alone or in combination, teaches the controller is configured to determine that “the at least one third antenna is to be used by the LTE transceiver as an LTE downlink connection receive antenna, and wherein the controller is further configured to determine that the at least one third antenna is to be used

concurrently by the WLAN transceiver as a WLAN connection transmit antenna.” Appeal Br. 16–22; Reply Br. 2–5. In particular, Appellant argues that Gans does not teach a system with concurrent transmission and reception, but instead teaches a system comprising a shared antenna that supports “simultaneous transmission or reception.” Appeal Br. 17–18 (quoting Gans, col. 6, ll. 58–61); Reply Br. 2–3. Appellant argues that one of ordinary skill in the art would not understand Gans’s disclosure of conventional diplexers or circulators connected to shared antennas (*see* Gans, Fig. 7 (260)) to facilitate concurrent (i.e., simultaneous) transmission and reception on the shared antenna. Appeal Br. 18.

We do not find Appellant’s arguments persuasive of Examiner error. Gans describes the antenna system illustrated in Figure 7 as having both a transmitting portion and a receiving portion. Gans, col. 6, ll. 48–52. Gans further describes the use of “conventional diplexers and/or circulators . . . to facilitate simultaneous transmission or reception of two signals utilizing a common broadbeam antenna element.” Gans, col. 6, ll. 55–61.



Figure 7 of Gans is illustrative and is reproduced below:

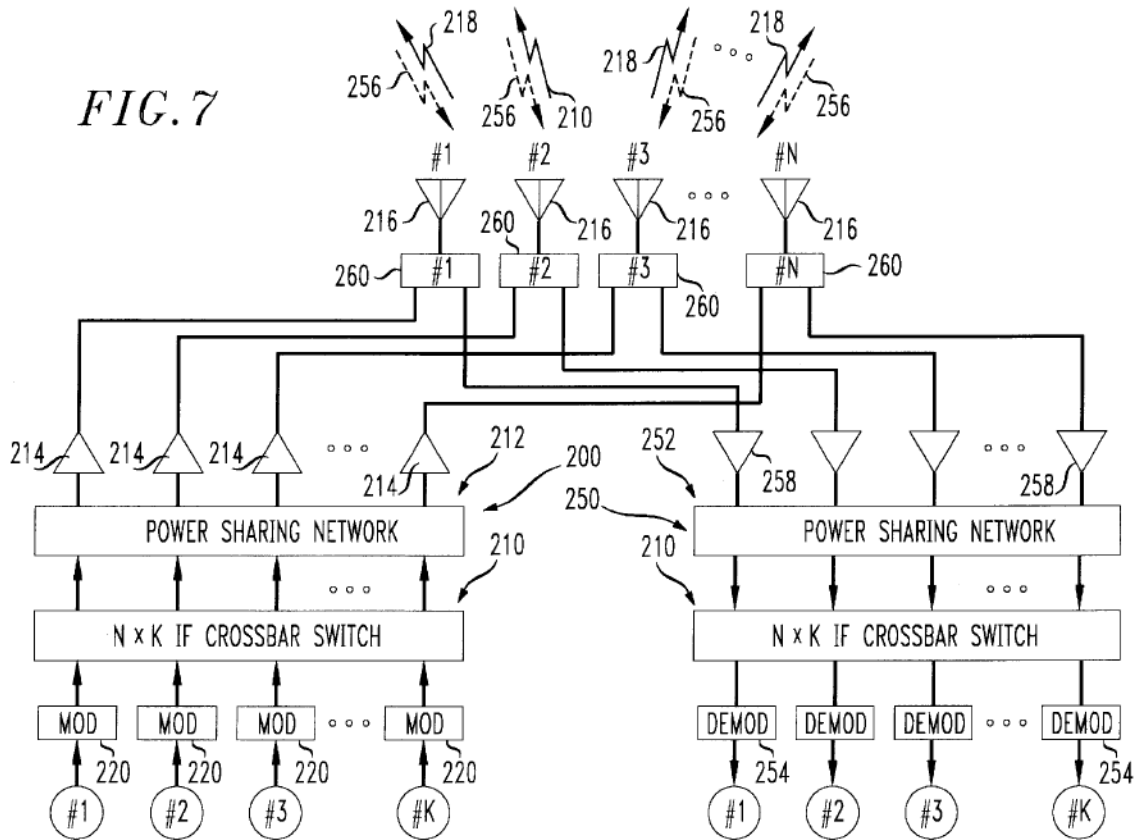


Figure 7 of Gans “is a block diagram of the antenna system of the present invention employing a plurality of circulators to couple the antenna systems of FIGS. 5 and 6 to one another.” Gans, col. 3, ll. 3–5. Gans describes the antenna system of Figure 5 is for transmitting and the antenna system of Figure 6 is for receiving. Gans, col. 2, l. 66–col. 3, l. 2. Thus, the incorporation of the circulators allows the antennas (216) to be shared by the transmit path (220-210-200-214) and the receive path (258-250-210-254). See Gans, col. 6, ll. 48–61. As shown, a common broadband antenna (216) is coupled to circulator (260) that is coupled to both the transmit path (via linear amplifier (214)) and the receive path (via pre-amplifier (258)). See Gans, col. 6, ll. 10, 30, Fig. 7. We do not understand Gans’s description of

using conventional circulators “to facilitate simultaneous transmission or reception of two signals utilizing a common broadbeam antenna element” to preclude simultaneously (or concurrently) transmitting the signal from linear amplifier (214) and receiving the signal to be sent to pre-amplifier (258). Instead, as shown (and as would be understood by one of ordinary skill in the art) the use of conventional circulators allows the shared antenna to simultaneously (i.e., concurrently) transmit a signal from the transmit path and receive a signal to be sent to the receive path. Further, consistent with the broad claim language of claim 40, Figure 7 of Gans illustrates the antenna (216) *is to be used* as a downlink receive antenna and is also “*to be concurrently used*” as a transmit antenna. *See* claim 40 (emphasis added).

Moreover, we note (as does the Examiner) that to overcome a written description rejection in the pending case as well as in the companion case (i.e., Application No. 14/062,982) during prosecution, Appellant indicated that the claim language regarding the third antenna is “to be used” as a downlink connection and a transmit antenna includes “active reception/transmission and idle reception/transmission as long as the antenna is ‘earmarked’ as having an LTE downlink and a WLAN transmit connection.” Response After Final 10 (filed May 10, 2017). Appellant further stated, “the claim language is not limited to the specific scenario where the LTE antenna is actively using the downlink connection and the WLAN is actively transmitted.” Response After Final 10. Similarly during prosecution of the companion application, Appellant, referring to the discussion in the 15/137,021 application, indicated “**[t]he same is true for the present Application.**” 14/062,982 Response After Final 10 (filed August 11, 2017). *See also* Ans. 3–4 (the Examiner explaining that during

an Applicant-initiated interview to discuss the written description rejection, counsel for Appellant identified the circulator (810) of Appellant's Figure 8 as providing written description support for simultaneous transmission and reception even though, as the Examiner notes, "the entire specification is absent on simultaneous transmission and reception").

Still further, the Examiner identified evidential reference Cox et al. (US 2005/0014472 A1; Jan. 20, 2005) ("Cox") to demonstrate it was well-known in the art to use circulators (as in Gans) to allow for simultaneous transmit and receive operation from a common antenna. *See* Final Act. 9 (citing Cox ¶ 22, Fig. 1B); Ans. 4; *see also* Cox ¶ 22 ("The circulator 120 permits full-duplex operation where transmission and reception can occur simultaneously in time. A circulator is a three port non-reciprocal electronic device that is well-known in the art.").

Thus, we agree with the Examiner's findings that Gans (in combination with Mantravadi) teaches or reasonably suggests simultaneously/concurrently using the claimed third antenna for LTE downlink reception and WLAN transmission. *See* Final Act. 8–9.

Appellant also argues Mantravadi does not teach simultaneously transmitting on a first network and receiving from a second network using the same shared antenna. Appeal Br. 19. Instead, Appellant asserts Mantravadi teaches using a switch as an improvement over a diplexer to alternatively connect the antenna to an LTE transceiver and a WLAN transceiver. Appeal Br. 19 (citing Mantravadi ¶¶ 27–32, Fig. 5). Further, Appellant argues Mantravadi's description of using its antenna for either the LTE network or the WLAN network teaches away from a simultaneous

transmission and reception. Appeal Br. 19–20 (citing Mantravadi ¶ 45); Reply Br. 3.

As an initial matter, we note that Figure 5 of Mantravadi illustrates a configuration wherein an antenna (532) is coupled to a diplexer and/or switch (530) and is configured (earmarked) to be used as a downlink to the LTE transceiver (423) and an uplink for the WLAN transceiver (421). See Mantravadi, Fig. 5.

“A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *Ricoh Co., Ltd. v. Quanta Computer, Inc.*, 550 F.3d 1325, 1332 (Fed. Cir. 2008) (citations omitted). “[T]he ‘mere disclosure of more than one alternative’ does not amount to teaching away from one of the alternatives where the reference does not ‘criticize, discredit, or otherwise discourage the solution claimed.’” *SightSound Techs., LLC v. Apple Inc.*, 809 F.3d 1307, 1320 (Fed. Cir. 2015) (quoting *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004)); see also *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009) (“A reference does not teach away . . . if it merely expresses a general preference for an alternative invention.”).

Here, we disagree with Appellant that Mantravadi teaches away from an “antenna to be used by an LTE transceiver as an LTE downlink connection receive antenna while simultaneously . . . [being] used by the WLAN transceiver as a WLAN connection transmit antenna,” as recited in claim 40. Contrary to Appellant’s assertions, Mantravadi does not criticize,

discredit, or otherwise discourage one from using a circulator, as taught by Gans, in place of the diplexer or switch of Figure 5.

Appellant also argues that the Examiner’s proposed combination of Mantravadi and Gans—i.e., replacing Mantravadi’s diplexer/switch with Gans’s circulator—would not teach simultaneously transmitting on one network (e.g., a WLAN network) while receiving on a different network (e.g., a LTE network). Appeal Br. 20–21.<sup>4</sup> Appellant argues that Gans does not teach transmitting or receiving from two networks, but rather “simultaneously receiving and transmitting to/from a single network.” Appeal Br. 20. Appellant asserts the “incorporation of the diplexer/circulator 260 of *Gans* incorporated into *Mantravadi* would merely implement the same transmission/reception to/from the same network (either LTE or WLAN; not both).” Appeal Br. 21.

Non-obviousness cannot be established by attacking references individually where, as here, the ground of unpatentability is based upon the teachings of a combination of references. *In re Keller*, 642 F.2d 413, 426 (CCPA 1981). Rather, the test for obviousness is whether the combination of references, taken as a whole, would have suggested the patentee’s invention to a person having ordinary skill in the art. *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

The Examiner relies on Mantravadi to teach, *inter alia*, an LTE transceiver having a dedicated antenna, a WLAN transceiver having its own dedicated antenna, and third antenna that may be used by either the LTE

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<sup>4</sup> Appellant makes a similar argument regarding Cox. See Appeal Br. 21–22. Because the Examiner’s rejection is based on the combined teachings of Mantravadi and Gans (Cox is used as an evidential reference), we do not address this argument.

transceiver or the WLAN transceiver. Final Act. 6–8; Ans. 5–6. Thus, Mantravadi teaches communication with two different networks. The Examiner relies on Gans’s teaching of a circulator, instead of Mantravadi’s diplexer/switch, to teach a configuration that allows for the shared antenna in Mantravadi to be used for reception on the LTE network simultaneously/concurrently with the antennas to be used for transmission on the WLAN network. Final Act. 8–9; Ans. 6. As such, Appellant’s arguments do not apprise us of error as they relate to the individual teachings of Mantravadi and Gans rather than the combined teachings of the references, as articulated by the Examiner.

For the first time in the Reply Brief, Appellant belatedly asserts that an ordinarily skilled artisan would not have been motivated to modify Mantravadi’s system with the circulator of Gans but for hindsight reasoning on the part of the Examiner. Reply Br. 4–5. Appellant argues that one of ordinary skill in the art would not refer to Gans because Gans fails to teach multiple radio access technologies and simultaneous uplink and downlink on a shared antenna. Reply Br. 4.

These arguments were not made in the Appeal Brief, but could have been, and are not responsive to any new evidence or finding set forth by the Examiner in the Answer. In the absence of a showing of good cause by Appellant, this argument is untimely and deemed waived.

Any argument raised in the reply brief which was not raised in the appeal brief, or is not responsive to an argument raised in the [E]xaminer’s answer, including any designated new ground of rejection, will not be considered by the Board for purposes of the present appeal, unless good cause is shown.

37 C.F.R. § 41.41(b)(2); *see also Ex parte Nakashima*, 93 USPQ2d 1834, 1837 (BPAI 2010) (informative) (explaining that arguments and evidence

not presented timely in the principal brief, will not be considered when filed in a Reply Brief, absent a showing of good cause explaining why the argument could not have been presented in the principal brief); *Ex parte Borden*, 93 USPQ2d 1473, 1474 (BPAI 2010) (informative) (“[T]he reply brief [is not] an opportunity to make arguments that could have been made in the principal brief on appeal to rebut the Examiner’s rejections, but were not.”).

Moreover, even if we were to consider Appellant’s untimely arguments, we do not find them persuasive of Examiner error. The Examiner finds that one of ordinary skill in the art would have been motivated to modify Mantravadi’s teaching of supporting multiple radio access technologies in a mobile device having a limited number of antennas with Gans’s teaching of a circulator to facilitate a shared antenna configuration “to enhance the communication efficiency and cost of the mobile device.” Final Act. 9 (citing Gans, col. 1, ll. 46–67). This is also consistent with Mantravadi’s express statement that “it is desirable to support all radio technologies on the wireless device with a limited number of antennas such that desired performance may be achieved.” Mantravadi ¶ 40. Thus, we find the Examiner has set for the requisite “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (cited with approval in *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007)).

For the reasons discussed *supra*, we are unpersuaded of Examiner error. Accordingly, we sustain the Examiner’s rejection of independent claim 40. For similar reasons, we also sustain the Examiner’s rejection of independent claims 44, 49, 53, 58, and 59, which recite commensurate

limitations and were not argued separately. *See* Appeal Br. 14 n.2; *see also* 37 C.F.R. § 41.37(c)(1)(iv). Additionally, we sustain the Examiner’s rejection of claims 41–43, 45–48, 50–52, and 54–57, which depend directly or indirectly therefrom and were not argued separately. *See* 37 C.F.R. § 41.37(c)(1)(iv).

### CONCLUSION

We summarily affirm the Examiner’s provisional obviousness-type double patenting rejection of claims 40–59.

We affirm the Examiner’s decision rejecting claims 40–59 under 35 U.S.C. § 103.

### DECISION SUMMARY

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
40–59		Provisional Obviousness-type Double Patenting	40–59	
40–59	103	Mantravadi, Gans	40–59	
<b>Overall Outcome</b>			40–59	



Appeal 2019-002977  
Application 15/137,021

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)(1)(iv). *See* 37 C.F.R. § 41.50(f).

AFFIRMED