UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/361,434	11/27/2016	Yehuda BINDER	BINDER-014-US2	2519

131926 7590 06/10/2020

May Patents Ltd. c/o Dorit Shem-Tov
P.O.B 7230
Ramat-Gan, 5217102
ISRAEL

EXAMINER
KHAN, HASSAN ABDUR-RAHMAN

ART UNIT	PAPER NUMBER
2456	

MAIL DATE	DELIVERY MODE
06/10/2020	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte YEHUDA BINDER and BENJAMIN MAYTAL

Appeal 2019-000272
Application 15/361,434
Technology Center 2400

Before JOHN A. JEFFERY, JUSTIN BUSCH, and LINZY T. McCARTNEY, *Administrative Patent Judges*.

JEFFERY, *Administrative Patent Judge*.

DECISION ON APPEAL

Under 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 21–40. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM IN PART.

[1] We use the word "Appellant" to refer to "applicant" as defined in 37C.F.R. § 1.42. Appellant identifies the real party in interest as May Patents Ltd. Appeal Br. 1.

STATEMENT OF THE CASE

Appellant's invention is a control system used in connection with a vehicle, where the system uses a server implementing gateway or control functionalities. *See* Abstract; Spec. 1.[2] To this end, the invention uses sensors that provide information on environmental conditions and events, and actuators that effect or generate a physical phenomenon responsive to an electrical command, which can be an electrical signal (*e.g.*, voltage or current), or by changing a device's characteristic, such as its resistance or impedance. Spec. 16–18. Controller functionality can be integrated in a server 151 external to the vehicle as shown in Figures 15 and 15a, where sensor data is relayed to the controller via a router inside the vehicle and the Internet. *See* Spec. 162–63, 218. Claim 21 is illustrative:

21. A system for controlling a phenomenon in a vehicle for use with an in-vehicle network for communication in the vehicle, the system comprising:

an Internet-connected server external to the vehicle connected to an external network;

a router in the vehicle connected between the in-vehicle network and the external network for transporting digital data therebetween;

a sensor in the vehicle for producing a first signal in response to the phenomenon;

a first apparatus in the vehicle that comprises, or is connected to, the sensor, and operative to transmit the first signal to the router over the in-vehicle network;

an actuator in the vehicle for affecting the phenomenon in response to a second signal; and

a second apparatus in the vehicle that comprises, or is connected to, the actuator, and operative to receive the second signal from the router over the in-vehicle network,

[2] Throughout this opinion, we refer to the substitute Specification filed November 29, 2017.

wherein the system is configured to transmit the first signal to the server by the router over the external network, to produce by the server the second signal in response to the first signal, and to receive the second signal from the server by the router over the external network.

RELATED APPEALS

On page 2 of the Appeal Brief, Appellant informs us of one related appeal in copending application 13/733,634. That appeal has been decided. *See Ex parte Binder*, Appeal 2018-007694 (PTAB Mar. 2, 2020) ("Bd. Dec."), *reh'g denied* (PTAB May 18, 2020).

Although not indicated in the Appeal Brief or Reply Brief, this appeal is also related to three other appeals in copending applications 15/361,434; 15/716,881; and 15/657,163, the latter of which has been decided. *See Ex parte Binder*, Appeal 2019-002056 (PTAB May 4, 2020).

THE REJECTIONS

The Examiner rejected claims 21–40 under 35 U.S.C. § 112, second paragraph as indefinite. Final Act. 3.[3]

The Examiner rejected claims 21–36 and 38–40 under 35 U.S.C. § 103 as unpatentable over Addepalli (US 2014/0215491 Al; published July 31, 2014) and Norris (US 2007/0198144 Al; published Aug. 23, 2007). Final Act. 4–15.

[3] Throughout this opinion, we refer to (1) the Final Rejection mailed August 6, 2018 ("Final Act."); (2) the Appeal Brief filed August 26, 2018 ("Appeal Br."); (3) the Examiner's Answer mailed October 2, 2018 ("Ans."); and (4) the Reply Brief filed October 10, 2018 ("Reply Br.").

The Examiner rejected claim 37 under 35 U.S.C. § 103 as unpatentable over Addepalli, Norris, and Gelvin (US 2015/0046582 Al; published Feb. 12, 2015). Final Act. 15–16.

THE INDEFINITENESS REJECTION

The Examiner determines that the claims are indefinite because, when read in light of the Specification, it is unclear what particular structure corresponds to the recited first and second apparatuses and server, thus rendering the claims' scope "unclear and confusing." Final Act. 3; Ans. 4.

Appellant argues that the Examiner not only confuses the claims' breadth with indefiniteness, but also fails to show why skilled artisans would not understand the claimed invention. Appeal Br. 4–5; Reply Br. 2–3.

ISSUE

Has the Examiner erred in rejecting claims 21–40 under § 112, second paragraph as indefinite? This issue turns on whether ordinarily skilled artisans would understand what is meant by the recited first and second apparatuses and server.

ANALYSIS

We begin by noting that the claimed first and second apparatuses are not recited in terms of what they *are*, but rather what they *do*, namely that they transmit and receive signals to and from the router, respectively. That is, apart from indicating that the first and second apparatuses are in a vehicle and connected to (or comprise) the sensor and actuator, respectively, the

claim recites no particular apparatus structure to perform the recited signal transmission and reception functions.

Although omitting the term "means" in a claim element creates a rebuttable presumption that § 112, sixth paragraph does not apply, such an omission does not automatically prevent that element from being construed as a means-plus-function element. *See Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (en banc). In such a case, § 112, sixth paragraph will apply if the claim term fails to recite sufficiently definite structure, or else recites function without reciting sufficient structure for performing that function. *See id.* at 1349.

That is the case here. The term "apparatus" is merely a generic description for a device that performs the recited functions, despite the recited apparatuses being in a vehicle and connected to (or comprising) the sensor and actuator, respectively. That is, the recited "first apparatus" and "second apparatus" are merely nonce words or "non-structural generic placeholders" that are equivalent to the term "means" because they fail to connote sufficiently definite structure and, in the context of the claimed invention, invoke § 112, sixth paragraph. *Cf. id.* at 1350 (noting that generic terms such as "mechanism," "element," "device," and other nonce words that reflect nothing more than verbal constructs may be recited in a manner that is tantamount to using the word "means" because they typically do not connote sufficiently definite structure and, therefore, may invoke § 112, sixth paragraph); *see also* Manual of Patent Examining Procedure (MPEP) § 2181(I)(A) (9th ed. Rev. 08.2017, Jan. 2018) (including the term "apparatus for" in a list of non-structural generic placeholders that may invoke § 112, second paragraph). Nor do the apparatuses' respective

modifying terms, namely "first" and "second," add sufficient structure to the recited elements to preclude § 112, sixth paragraph construction, for they merely distinguish one apparatus from the other.

Because the recited first and second apparatus limitations are equivalent to means-plus-function limitations under § 112, sixth paragraph, they must be construed in light of the corresponding structure in the Specification and its equivalents. *See In re Donaldson Co., Inc.*, 16 F.3d 1189, 1193 (Fed. Cir. 1994) (en banc).

On page 3 of the Appeal Brief, Appellant refers to numerals 23a, 23b, or 23c in Figure 24 for disclosing both the first and second apparatuses. Appellant also cites the Specification's (1) page 16, line 13 to page 17, line 2 for disclosing the first apparatus, and (2) page 17, line 13 to page 18, line 9 for disclosing the second apparatus. Appeal Br. 3.

As shown in Appellant's Figure 24, numerals 23a–c are "field units" that are connected to control network 22 in vehicle 241. *See* Spec. 218, 222 (noting that a field unit may connect to a diagnostic connector for accessing (1) various sensors or actuators coupled to the connector, or (2) information available via the connector). According to the Specification's page 18, a "field unit" refers to an actuator unit, sensor unit, or sensor/actuator unit. An actuator unit may include one or more actuators, and a sensor unit may include one or sensors. Spec. 16–17. Notably, both actuator and sensor units (and therefore field units) may include a *modem or transceiver* coupled to a port (such as a connector or antenna) for interfacing and communicating over a network. *See* Spec. 16–17; *see also id.* at 20 (noting that one or more vehicle networks may be used for communication between two or more field units, and to allow the field units to communicate with a router).

This disclosed field unit communication functionality that includes, among other things, a modem or transceiver, provides the requisite structure in the Specification corresponding to the first and second apparatuses to perform their recited functions, namely that they transmit and receive signals to and from the router, respectively. To the extent the Examiner finds otherwise (*see* Final Act. 3; Ans. 4), we disagree.

Although the recited apparatus limitations are effectively means-plus-function limitations that are construed to cover the corresponding structure in the Specification and its equivalents as noted above, we nonetheless note that merely because a claim is broad in scope does not mean that it is indefinite. *See In re Gardner*, 427 F.2d 786, 788 (CCPA 1970) ("Breadth is not indefiniteness."); MPEP § 2173.04 (citing *Gardner*). Therefore, to the extent that the Examiner's indefiniteness rejection is premised on the recited apparatuses being recited overly broadly (*see* Final Act. 3; Ans. 4), such a determination not only ignores the fact that the term "apparatus" is a nonce word invoking § 112, sixth paragraph, but runs counter to the fundamental legal principle that breadth is not indefiniteness as noted above. To the extent that the Examiner's rejection is premised on these functional limitations not being enabled for their scope under § 112, first paragraph,[4]

[4] *See In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993) ("[T]he specification of a patent must teach those skilled in the art how to make and use *the full scope* of the claimed invention without 'undue experimentation.'") (emphasis added); *see also* MPEP § 2164.08 (citing *Wright*); *Ex parte Rodriguez*, 92 USPQ2d 1395, 1406–11 (BPAI 2009) (precedential) (discussing functional claiming and scope of enablement); MPEP § 2181(I)(C) (citing *Rodriguez*).

no such rejection was made, nor will we engage in that inquiry here in the first instance on appeal.

We also find problematic the Examiner's indefiniteness rejection regarding the recited Internet-connected server configured to (1) receive the first signal from the router; (2) produce a second signal responsive to the first signal; and (3) transmit the second signal to the router. On page 3 of the Appeal Brief, Appellant refers to numeral 24 in Figure 24 for disclosing the recited server. Appellant also cites the Specification's (1) page 69, line 21 to page 70, line 8 and (2) page 70, line 20 to page 71, line 2 for disclosing the recited server. Appeal Br. 3.

As explained on page 70 of the Specification, the invention includes an Internet-connected control server, disposed outside an enclosed vehicular environment, where the server (1) receives sensor data corresponding to sensor response signals, and (2) executes control logic to generate actuator commands responsive to the received sensor data. This functionality considered in light of the functionality shown in connection with numeral 24 in Figure 24 would enable ordinarily skilled artisans to understand the recited server. To the extent that the Examiner finds otherwise (*see* Final Act. 3; Ans. 4), we disagree.

Therefore, we are persuaded that the Examiner erred in rejecting claims 21–40 as indefinite.

THE OBVIOUSNESS REJECTION OVER ADDEPALLI AND NORRIS

Regarding independent claim 21, the Examiner finds that Addepalli discloses a system for controlling a phenomenon in a vehicle for use with an in-vehicle network, where the system includes (1) an Internet-connected

server external to the vehicle connected to an external network; (2) a router in the vehicle connected between the in-vehicle network and the external network; and (3) a sensor in the vehicle for producing a first signal responsive to the phenomenon. Final Act. 4–6. Although the Examiner acknowledges that Addepalli does not expressly disclose the recited first and second apparatuses, actuator, and signal transmissions to and from the server in the claim's last clause, the Examiner cites Norris as teaching these features in concluding that the claim would have been obvious. Final Act. 6–8.

Appellant argues that not only is the Examiner's rejection unclear, but it is based on an improper rationale, particularly since modifying Addepalli's vehicle to read sensor data and receive external commands as the Examiner proposes changes the operating principle where a human controls the vehicle. Appeal Br. 6–11; Reply Br. 3–4. Appellant adds that the cited prior art fails to teach a sensor and actuator associated with the same phenomenon, let alone a server that produces and transmits a second signal to a vehicle-based router responsive to a first signal received from the router as claimed. Appeal Br. 11–12; Reply Br. 3–4. Appellant argues various other recited limitations summarized below.

ISSUES

I. Under § 103, has the Examiner erred by finding that Addepalli and Norris collectively would have taught or suggested:

(1) a system for controlling a phenomenon in a vehicle configured to (a) transmit a first signal to an external Internet-connected server by a router over an external network; (b) produce, by the server, a second signal

responsive to the first signal; and (c) receive the second signal from the server by the router over the external network as recited in claim 21 ("the server signal limitation")?

(2) the limitations of claims 22, 23, 27, 28, 30, 34, and 39?

II. Is the Examiner's proposed combination of the cited references supported by articulated reasoning with some rational underpinning to justify the Examiner's obviousness conclusion?

ANALYSIS

Claims 21, 24–26, 29, 31–33, 35–38, and 40

As noted above, the Examiner cites Addepalli for teaching the recited external server and vehicle-based router and sensors, and Norris for teaching claim 21's remaining limitations, including the last clause reciting, among other things, that the server produces a second signal responsive to receiving the first signal from the vehicle's router over an external network, where the second signal is received by the router over that network. *See* Final Act. 4–8. On this record, we see no error in the Examiner's conclusion that claim 21 would have been obvious over these collective teachings.

As shown in Addepalli's Figure 1, vehicle 4 includes sensors 14a–c connected to respective electronic control units (ECUs) 16a–c that are connected to Ethernet gateway switch 70 associated with the vehicle's on-board unit (OBU) 30. Addepalli ¶¶ 43–44. The vehicle's ECU 16d is also connected to actuator 13. Addepalli ¶ 44. These components and their connections are shown in Addepalli's Figure 1 reproduced below.

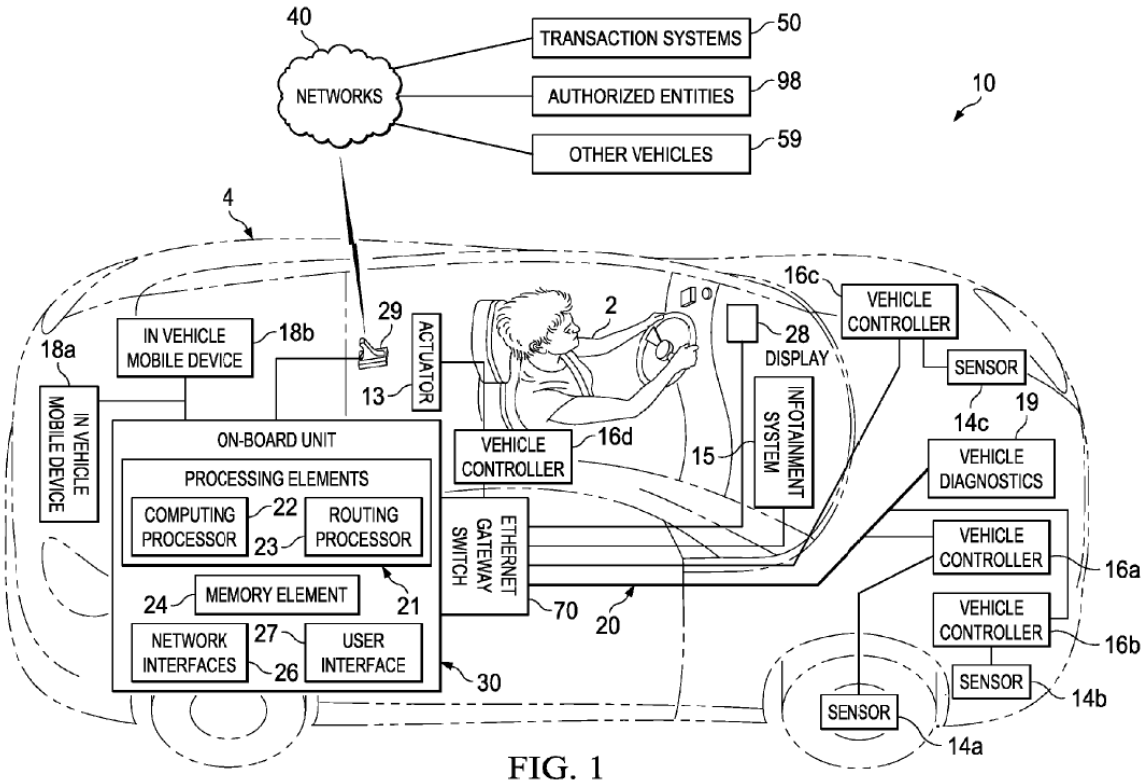

FIG. 1

Addepalli's vehicle component connections in Figure 1

As shown above, not only are sensors and actuator connected to the Ethernet gateway switch 70 and OBU via their respective ECUs 16a–d, but the OBU is also connected to various remote nodes via external networks 40, where the remote nodes include, among other things, authorized entities 98 that can be *servers*. *See* Addepalli ¶¶ 45, 57. Given this functionality, the vehicle's OBU and Ethernet gateway switch 70 collectively function as a router between the networks both inside and outside the vehicle. *See id.*

Although the vehicle's ECUs fully meet the recited apparatuses because they are connected to sensors and actuator, respectively, we nonetheless see no error in the Examiner's reliance on Norris for at least

suggesting this feature as well as the server signal limitation, particularly when considered in light of Addepalli.

Norris discloses a system for controlling vehicles and vehicular sensors, actuators, and communications. Norris ¶ 5. To this end, various payloads and the vehicle control system are controlled by two operator control units (OCUs), namely (1) a dashboard OCU, and (2) a remote OCU, the latter used by a person that is not traveling in the vehicle. Norris ¶ 11. As explained in Norris's paragraph 12, the OCUs (1) receive data from the vehicle's control system or payloads, and (2) send commands to the vehicle control system to control its functions. *See also id.* ¶¶ 38 ("The remote OCU may receive data from the autonomous vehicle related to the position, orientation, obstacles, or other similar data and transmit movement commands or payload commands accordingly."), 43, 46.

As shown in Norris's Figure 2A, remote OCU 250 is connected to the vehicle's control system via radio links. As explained in paragraphs 78 and 79, the remote OCU not only includes a router, but is also connected to the vehicle via a long-range physical and data link layer including radio and satellite links.

This remote vehicle control functionality at least suggests (1) transmitting a first signal associated with data from the vehicle's control system or payloads to a remote control device, namely a remote OCU, over an external network; (2) in response to receiving this first signal, the remote OCU produces a second signal that commands the vehicle to control its associated functions; and (3) the remote OCU transmits this second signal to the vehicle to control those functions. *See* Norris ¶¶ 11–12, 38, 43, 45–46, 65. Norris also at least suggests sensing and affecting the same

phenomenon, such as phenomena related to the vehicle's movement. *See* Norris ¶ 38 (noting that the remote OCU (1) receives data from the vehicle *related to the position, orientation, obstacles, or other similar data*, and (2) transmits *movement* commands or payload commands accordingly); 46 (noting that remote OCU receives vehicle *sensor* data). Appellant's contention, then, that the cited references fail to teach sensing and affecting the same phenomenon (Appeal Br. 11) is unpersuasive given Norris's teachings, particularly when considered in light of Addepalli's above-noted vehicle control functionality.

Notably, after Norris's remote OCU receives *sensor* data from the vehicle, the remote OCU analyzes that data. Norris ¶ 46. Then, a human operator inputs commands into the remote OCU that are transmitted to the vehicle control system. *Id.* After receiving these commands, the vehicle control system controls vehicle functions accordingly by, for example, sending control data to the vehicle's *actuators*. *Id.*

Notably, this process—including the remote OCU's received sensor data analysis—is automatic except for the human operator inputting commands into the remote OCU. Nevertheless, claim 21 does not preclude at least some manual steps, such as data entry, in connection with the recited system functionality. Nor does the claim require that the various recited functions, such as those performed by the recited apparatuses and server, are performed *automatically*. But even if it did, and even assuming, without deciding, that some manual steps were required for Norris's remote OCU to generate commands via the above-noted technique, that is not dispositive here, for the term "automatic" does not preclude at least some manual steps, so long as other steps are automatic. *See CollegeNet, Inc. v. ApplyYourself,*

Inc., 418 F.3d 1225, 1235 (Fed. Cir. 2005). Nor has Appellant shown that performing these functions automatically in lieu of at least some manual interaction would have been uniquely challenging or otherwise beyond the level of ordinarily skilled artisans. *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161–62 (Fed. Cir. 2007) ("Applying modern electronics to older mechanical devices has been commonplace in recent years."). To the extent Appellant contends otherwise, there is no persuasive evidence on this record to substantiate such a contention. So even assuming, without deciding, that Norris's remote OCU functionality requires at least some manual intervention, such a fact is not dispositive here, particularly in view of modern electronic updates to older manual techniques that are consistent with similar electronic updates noted by the court in *Leapfrog*. In any event, it is well settled that merely replacing manual activity with automatic means to accomplish the same result is an obvious improvement. *See In re Venner*, 262 F.2d 91, 95 (CCPA 1958).

Therefore, Appellant's contention that the cited references dictate control by a human operator or user (Appeal Br. 11–12) are not only incommensurate with the scope of the claim that does not preclude at least some manual intervention in connection with the various recited functions, they are unpersuasive even if the claim recited that these functions are automatic—which it does not.

Nor are we persuaded of error in the Examiner's rationale for combining Addepalli and Norris despite Appellant's arguments to the contrary (*see* Appeal Br. 6–11; Reply Br. 3–4). A key aspect of the Examiner's rationale relies on the notion that the proposed combination provides the ability to control various vehicle functions automatically,

including those of the vehicle's actuators. *See* Final Act. 8. Given this automatic functionality realized by the proposed combination, the Examiner concludes that the recited limitations—including the server signal limitation—would have been obvious over the cited references' collective teachings. *See id.*

We see no error in these findings and conclusions. First, although Addepalli's vehicle is operated by a human driver 2 as shown in Figure 1, that does not mean that at least some of the vehicle's functions, including those associated with the vehicle controllers and actuators, cannot be controlled remotely via a server either as a replacement for, or as an adjunct to, the driver's involvement in controlling those functions. We reach this conclusion noting Addepalli's OBU is not only connected to the vehicle controllers via an Ethernet gateway switch, but is also connected to remote nodes, including *server*-based authorized entities 98, via external networks 40. *See* Addepalli ¶¶ 45, 57. Providing remote vehicle control capabilities via these remote servers would have been at least an obvious variation, particularly in light of Norris's remote control capabilities that are realized via a remote OCU as noted previously. In short, such an enhancement uses prior art elements predictably according to their established functions—an obvious improvement. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 417 (2007).

Appellant's contention that the Examiner's proposed combination would change Addepalli's principle of operation by providing autonomous vehicle control from an external, Internet-based system that ostensibly runs counter to the "conventional wisdom" that such systems are inside the vehicle (*see* Appeal Br. 8–10) is unavailing. Leaving aside the fact that this

assertion is unsubstantiated, it ignores the fact that *every* vehicle function—including driving—need not be controlled remotely under the proposed combination, but rather just some (or even just one) of those functions. Nevertheless, even assuming, without deciding, that every vehicle function could be controlled remotely under the proposed combination, this remote control capability need not replace those functions controlled by the driver, but could be provided merely as an *adjunct* to those driver-controlled functions. That Norris discloses both a remote OCU *and* a dashboard OCU with similar control functionality only underscores this point. *See* Norris ¶ 45 (noting that an operator may use a dashboard OCU *and/or* a remote OCU *simultaneously or separately* to control the vehicle's operation mode and other controls).

To the extent that Appellant contends that Addepalli and Norris are non-analogous art (*see* Appeal Br. 6–11; Reply Br. 4), we disagree. Prior art is analogous if it is (1) from the same field of endeavor regardless of the problem addressed, or (2) reasonably pertinent to the particular problem with which the inventor is involved. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). Here, not only are Addepalli and Norris both in the same field of endeavor as Appellant's invention, namely vehicular control systems, but they are also reasonably pertinent to Appellant's problem in that regard, namely how to control vehicular functions remotely.

Lastly, to the extent that Appellant contends that the Examiner's obviousness rationale is inconsistent with the patentably-distinct inventions articulated in a restriction requirement made during prosecution (*see* Appeal Br. 10), such a contention is unavailing. First, the propriety of the Examiner's restriction requirement that was made during prosecution is a

petitionable matter that is not before us, as are objections regarding procedural inconsistencies associated with that requirement. *See* MPEP § 706.01 ("[T]he Board will not hear or decide issues pertaining to objections and formal matters which are not properly before the Board."); *see also* MPEP § 1201 ("The Board will not ordinarily hear a question that should be decided by the Director on petition . . . ."); MPEP § 1002.02(c) (requiring that Technology Center Directors decide petitions from an Examiner's final decision requiring restriction in patent applications). Therefore, to the extent there are inconsistencies between the Examiner's restriction requirement and obviousness rejection, the Examiner's restriction requirement is not before us, nor are we bound by it. Rather, only the Examiner's obviousness rejection is before us—a rejection that is (1) articulated in the final Office Action from which this appeal was taken, and (2) based solely on the cited prior art.

Appellant's request, then, that we remand the case to the Examiner to reconsider the earlier restriction requirement (Appeal Br. 10) is not only based on a non-precedential Board decision that is not binding on this panel, Appellant's request pertains to petitionable matters that are not before us in any event. Accordingly, we deny the request.

Therefore, we are not persuaded that the Examiner erred in rejecting claim 21, and claims 24–26, 29, 31–33, 35–38, and 40 not argued separately with particularity.

Claim 22

We also sustain the Examiner's rejection of claim 22 reciting the external network comprises, or is part of, a vehicle-to-vehicle network for

communicating with the server via another vehicle. Despite Appellant's arguments to the contrary (Appeal Br. 12; Reply Br. 4–5), we see no error in the Examiner's reliance on Addepalli for at least suggesting the recited limitations. *See* Final Act. 8–9; Ans. 7. Not only do Addepalli's networks 40 enable vehicle 4 to communicate with both server-based authorized entities 98 *and* other vehicles 59 as shown in Figure 1, but Addepalli also teaches that vehicles can transfer data to a destination via other vehicles using peer-to-peer, multi-hop routing in Figure 4. *See* Addepalli ¶¶ 45, 81, 91. Appellant's contention that Addepalli does not teach external communication (Reply Br. 5) is unavailing given this vehicle-to-vehicle communication path external to the vehicle.

Therefore, we are not persuaded that the Examiner erred in rejecting claim 22.

Claim 23

We also sustain the Examiner's rejection of claim 23 reciting the external network communicates with a stationary roadside unit.

Although the Examiner's indication in the rejection that "claim 23 does not further define over the limitations in claim 21" is puzzling given the claims' different limitations as Appellant indicates (Appeal Br. 12), we nonetheless deem this error harmless, for the Examiner clarifies the rejection on page 7 of the Answer by finding that Addepalli's Figure 3 and paragraph 88 teach the recited limitations.

Despite Appellant's arguments to the contrary (Appeal Br. 13; Reply Br. 5–6), we see no error in the Examiner's reliance on Addepalli for at least suggesting the recited limitations, particularly given roadside infrastructure

device 146 that communicates not only with a vehicle 104a, but also other networks and vehicles via vehicle 104a in Addepalli's Figure 3.

Therefore, we are not persuaded that the Examiner erred in rejecting claim 23.

Claim 27

We also sustain the Examiner's rejection of claim 27 reciting the phenomenon is (1) external to the vehicle, *or* (2) associated with surroundings around the vehicle. Our emphasis on the term "or" underscores that only one of the recited alternatives need be taught or suggested by the prior art to satisfy the claim.

Although the Examiner's indication in the rejection that "claim 27 does not further define over the limitations in claim 21" is puzzling given the claims' different limitations as Appellant indicates (Appeal Br. 13–14), we nonetheless deem this error harmless, for the Examiner clarifies the rejection on page 8 of the Answer by finding that Norris's paragraph 47 teaches the recited limitations.

Despite Appellant's arguments to the contrary (Appeal Br. 13–14; Reply Br. 6–7), we see no error in the Examiner's reliance on the functionality of Norris's "Follow Me" mode in paragraph 47 that controls the vehicle's direction and speed to follow objects, such as other vehicles, identified by a sensor or camera. This vehicle-movement-based phenomenon that tracks an external object's movement direction is not only external to the vehicle, but is also at least *associated with* surroundings around the vehicle, including the road on which the object and the vehicle following that object travel, as well as the area in their relative vicinity.

Providing such an enhancement to the Addepalli/Norris system of claim 21 as the Examiner proposes uses prior art elements predictably according to their established functions—an obvious improvement. *See KSR*, 550 U.S. at 417.

Therefore, we are not persuaded that the Examiner erred in rejecting claim 27.

Claim 28

We also sustain the Examiner's rejection of claim 28 reciting the actuator is operative to affect the phenomenon that is (1) external to the vehicle, *or* (2) associated with surroundings around the vehicle. Our emphasis on the term "or" underscores that only one of the recited alternatives need be taught or suggested by the prior art to satisfy the claim.

Although the Examiner's indication in the rejection that "claim 28 does not further define over the limitations in claim 21" is puzzling given the claims' different limitations as Appellant indicates (Appeal Br. 14), we nonetheless deem this error harmless, for the Examiner clarifies the rejection on page 8 of the Answer by finding that Norris's Figures 2A and 2B and paragraphs 47 and 55 teach the recited limitations.

Despite Appellant's arguments to the contrary (Appeal Br. 14; Reply Br. 7–8), we see no error in the Examiner's reliance on the functionality of Norris's "Follow Me" mode in paragraph 47 that controls the vehicle's direction and speed to follow objects, such as other vehicles, identified by a sensor or camera. This vehicle-movement-based phenomenon that tracks an external object's movement direction is not only external to the vehicle, but is also at least *associated with* surroundings around the vehicle, including

the road on which the object and the vehicle following that object travel, as well as the area in their relative vicinity. Moreover, by controlling the vehicle's speed and direction to follow the object as noted in Norris's paragraph 47, the vehicle's movement-based phenomenon is affected.

Providing such an enhancement to the Addepalli/Norris system of claim 21 as the Examiner proposes uses prior art elements predictably according to their established functions—an obvious improvement. *See KSR*, 550 U.S. at 417.

Therefore, we are not persuaded that the Examiner erred in rejecting claim 28.

Claim 30

We also sustain the Examiner's rejection of claim 30 reciting that the system of claim 21 is further integrated with, *or* part of, a vehicular system used for improved safety, traffic flow control, traffic reporting, *or* traffic management. Our emphasis on the term "or" underscores that only one of each group of recited alternatives need be taught or suggested by the prior art to satisfy the claim.

Although the Examiner's indication in the rejection that "claim 30 does not further define over the limitations in claim 21" is puzzling given the claims' different limitations as Appellant indicates (Appeal Br. 14–15), we nonetheless deem this error harmless, for the Examiner clarifies the rejection on pages 8 and 9 of the Answer by finding that Addepalli's paragraph 56 teaches the recited limitations.

Despite Appellant's arguments to the contrary (Appeal Br. 14; Reply Br. 7–8), and leaving aside the fact that Norris's "Follow Me" mode at least

suggests a vehicular system that is used for improved safety and traffic control and management by restricting the vehicle's speed and stopping distance in paragraph 47, we nonetheless see no error in the Examiner's reliance on the functionality of Addepalli's paragraph 56 for at least suggesting the recited limitations. That Addepalli indicates that interconnecting the vehicular bus systems to Internet Protocol (IP) infrastructure can enable, among other things, *safety* to vehicular applications only bolsters this conclusion.

Appellant's contention that Addepalli does not teach a vehicular safety system (Reply Br. 9) is not only incommensurate with the scope of the claim that recites, quite broadly, that the vehicular system is merely *used for* "improved safety," Appellant's argument is undercut by Addepalli's and Norris's above-noted safety features realized by the disclosed vehicle systems. Providing such an enhancement to the Addepalli/Norris system of claim 21 as the Examiner proposes uses prior art elements predictably according to their established functions—an obvious improvement. *See KSR*, 550 U.S. at 417.

Therefore, we are not persuaded that the Examiner erred in rejecting claim 30.

Claim 34

We also sustain the Examiner's rejection of claim 34 reciting the in-vehicle network *uses* the vehicle's direct current (DC) power lines. Our emphasis on the term "uses" underscores that the claim recites, quite broadly, that the in-vehicle network merely *uses* DC power lines, but does not specify *how* those lines are used. That is, the network can *use* DC power

lines by, among other things, powering a component associated with the vehicle network by those lines. In other words, the claimed "use" does not require sending data over DC power lines, but could merely power network devices via DC power lines.

Nevertheless, despite Appellant's arguments to the contrary (Appeal Br. 15; Reply Br. 9–10), we see no error in the Examiner's reliance on Addepalli's paragraph 109 that teaches using *Ethernet over power line* connections, particularly when considered in light of the *DC* power provided near Ethernet ports and power distribution *along the Ethernet network* in Norris's paragraph 59. Providing such an enhancement to the Addepalli/Norris system of claim 21 as the Examiner proposes uses prior art elements predictably according to their established functions—an obvious improvement. *See KSR*, 550 U.S. at 417.

Therefore, we are not persuaded that the Examiner erred in rejecting claim 34.

Claim 39

We do not sustain the Examiner's rejection of claim 39 reciting that the router, first apparatus, or second apparatus is at least partly *powered via* an on-board diagnostics (OBD) system diagnostics connector. Our emphasis underscores that the claim requires that power is provided *via* the diagnostics connector. Although this limitation does not require the connector to be the *source* of electric power, power must nonetheless be provided *via* (i.e., *by way of*) the connector, possibly by enabling power to pass through the connector to one of the recited loads, namely the router or

first or second apparatuses. This connector-based powering feature has not been shown to be even suggested by the prior art.

First, the Examiner's indication in the rejection that "claim 39 does not further define over the limitations in claim 24" is puzzling given the claims' different limitations as Appellant indicates. *See* Appeal Br. 16. As with other instances of similar inconsistencies, however, we deem this error harmless, for the Examiner clarifies the rejection on page 9 of the Answer by finding that Norris's Figures 2A and 2B and paragraph 67 teach the recited limitations.

Nevertheless, we fail to see—nor has the Examiner shown—how this disclosure teaches or suggests power is provided *via* a diagnostic connector, let alone powering one of the recited devices via the connector as claimed.

The Examiner's reliance on Norris's Figures 2A and 2B and paragraph 67 on page 9 of the Answer is unavailing in this regard. To be sure, Norris's vehicle level control 202 includes a power center 208 that powers gearshift and brake motors 210, 212 as described in paragraph 67 and shown in Figure 2B. That figure also shows Controller Area Network (CAN) diagnostic port 206 is connected to the vehicle level control such that the port is connected to the power center 208.

But Norris says nothing about a diagnostic connector providing power either directly or indirectly to the recited devices. That Norris provides a power source 208 that is connected *directly* to gearshift and brake motors 210, 212 further undercuts the notion that power is somehow provided via a diagnostics connector as the Examiner seems to suggest.

Therefore, we are persuaded that the Examiner erred in rejecting claim 39.

THE OTHER OBVIOUSNESS REJECTION

We sustain the Examiner's obviousness rejection of claim 37 over Addepalli, Norris, and Gelvin. Final Act. 15–16. Because this rejection is not argued separately with particularity, we are not persuaded of error in this rejection for the reasons previously discussed.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/ Basis	Affirmed	Reversed
21–40	112, second paragraph	Indefiniteness		21–40
21–36, 38–40	103	Addepalli, Norris	21–36, 38, 40	39
37	103	Addepalli, Norris, Gelvin	37	
Overall Outcome			21–38, 40	39

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).

AFFIRMED IN PART