

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LOS ANGELES COUNTY METROPOLITAN
TRANSPORTATION AUTHORITY

Petitioner,

v.

TRANSPORT TECHNOLOGIES, LLC

Patent Owner.

Case IPR2016-01077

Patent 6,980,101

Before DAVID C. McKONE, GEORGIANNA W. BRADEN, and
MONICA S. ULLAGADDI, *Administrative Patent Judges*.

ULLAGADDI, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

A. Background

Los Angeles County Metropolitan Transportation Authority, Clark Construction Group LLC, and Atkinson Contractors LP (collectively, “Petitioner”) filed a Petition (Paper 4, “Pet.”)¹ for *inter partes* review of claims 1, 3, 5, 6, 8, and 10 (the “challenged claims”) of U.S. Patent No. 6,980,101 (Ex. 1001, “the ’101 patent”). Transport Technologies, LLC (“Patent Owner”) timely filed a Preliminary Response (Paper 8, “Prelim. Resp.”), along with a declaration by Patent Owner’s Declarant, Mr. Christopher Wilson (Ex. 2007). We instituted trial on all of the challenged claims of the ’101 patent on certain grounds of unpatentability alleged in the Petition. Paper 10 (“Institution Decision” or “Inst. Dec.”).

After institution of trial, Patent Owner responded to Petitioner’s challenges including filing a Patent Owner Response, along with a supplemental declaration by Mr. Wilson (Ex. 2016). Paper 22 (“PO Resp.”)². Petitioner timely filed a Reply. Paper 25 (“Reply”).

A hearing for IPR2016-01077 was held on June 8, 2017. The transcript of the hearing has been entered into the record. Paper 33 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This final written decision is issued pursuant to 35 U.S.C. § 318(a).

¹ This decision references the Corrected Petition filed on May 31, 2016. Paper 4.

² This decision references the Corrected Patent Owner Response filed on January 30, 2017. Paper 22.

Based on the complete record now before us, we determine Petitioner has shown, by a preponderance of the evidence, that each of the challenged claims of the '101 patent is unpatentable.

B. Related Proceedings

The parties inform us that the '101 patent is at issue in the following proceeding: *Transport Techs., LLC v. L.A. County Metro. Transp. Auth.*, Case No. 2:15-cv-6423-RSWL (C.D. Cal.), filed August 21, 2015. Pet. 1; Paper 7, 1. Petitioner filed a separate petition on August 19, 2016, for *inter partes* review, Case No. IPR2016-01633, that challenges the same claims of the '101 patent challenged in this proceeding. In that proceeding, on February 22, 2017, the Board entered a decision instituting trial as to claims 1, 3, 5, 6, 8, and 10 the '101 patent.

C. The '101 Patent

The '101 patent is entitled “Motor Vehicle Occupancy Signaling System” and discloses transmitting “a claim by a registrant as to the number of occupants traveling in a vehicle over a section of highway” that is associated with a high occupancy vehicle (HOV) incentive program. Ex. 1001, [54], [57]. The registrant’s claim is made when “traversing . . . one or more sections of highway at particular times of day and days of the year,” which are “deemed . . . qualifying ride-sharing event[s]” (QREs) by an agency that administers a ridesharing program. *Id.* at 1:51–56 (internal quotation marks omitted). In addition to a claim of occupancy, the '101 patent also discloses that the agency collects identifying information for the registrant to the ridesharing program. *Id.* at 1:66–2:1.

The '101 patent further discloses that the claim of occupancy is transmitted by a sending device, alternatively referred to as a transponder, “that is carried or attached to a motor vehicle” and that includes “circuitry [that] will uniquely

identify the transponder and the position of the switch claiming an occupancy level.” *Id.* at 2:59–66. Figure 2, reproduced below, is a diagram of the transponder or sending device. *Id.* at 2:32–33.

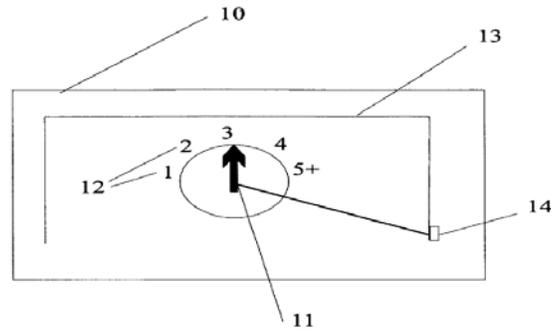


Figure 2 of the '101 patent depicts the transponder or sending device.

Figure 2 depicts sending device 10 “with a multiple position switch 11 that can point to a claimed occupancy level 12.” *Id.* at 2:60–62. Multiple position switch 11 permits claiming an occupancy level from 1 to 5 or more. *See id.* at Fig. 2. Sending device 10 “transmit[s] an identification code when passing by reading device 3.” *Id.* at 2:42–44. Figure 4, reproduced below, depicts processing performed by reading device 3.

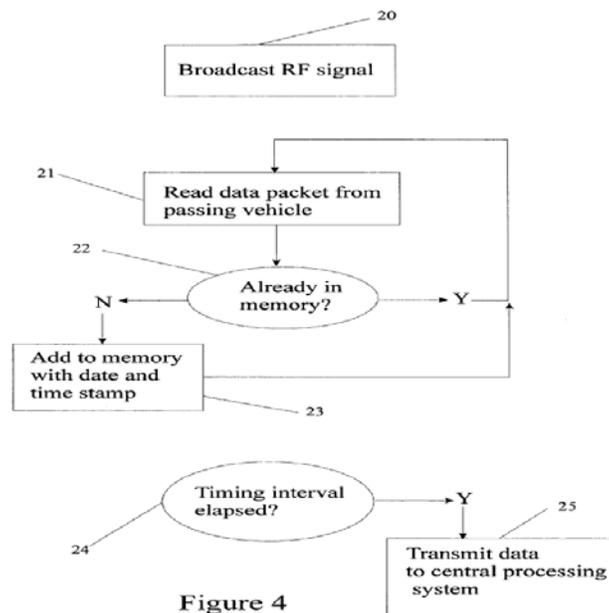


Figure 4

Figure 4 of the '101 patent depicts a process flow diagram for the reading device.

Reading device 3, using its receiver, listens for transmissions from sending device 10 of a passing vehicle that is within its radio frequency signal range. *Id.* at 3:15–18. The '101 patent further discloses that reading device 3 reads data transmitted from sending device 10, stores the data in memory, and transmits the data to a central processing system for the agency. *See id.* at 3:18–24, Fig. 4.

D. Illustrative Claims

As noted above, Petitioner challenges claims 1, 3, 5, 6, 8, and 10 of the '101 patent, of which claims 1 and 6 are independent. Both independent claims are reproduced below.

1. A vehicle occupancy monitoring system wherein a claim is made by a registrant about the number of occupants in a vehicle as it traverses a designated section of highway:

a transmitter that transmits a claim as to the number of occupants in the vehicle;

a sending transponder in the vehicle that transmits a code that uniquely identifies the registrant with the program administrator;

a reading data collector that can interrogate a vehicle within its range, and receive, store and transfer to a central processing facility said transmitted code identifying the registrant along with a time/date stamp.

Ex. 1001, 3:26–37.

6. A method of receiving claimed vehicle occupancy data about a vehicle by a registrant, and also identifying the registrant as the vehicle traverses a designated section of highway, said method comprising the steps of:

transmitting the number of occupants in a vehicle claimed by a registrant;

transmitting a signal from the vehicle that identifies the registrant;

and then receiving the claim by a registrant as to number of occupants in a vehicle and reading the signal from the vehicle that identifies the registrant as the vehicle transits the designated section of highway.

Id. at 4:13–25.

E. The Instituted Grounds of Unpatentability

We instituted trial based on the following grounds and evidence of record:

Reference(s)	Basis	Claims Challenged
Hassett '183 ³	§ 103	1, 3, 6, and 8
Hassett '183 and Hassett '389 ⁴	§ 103	5 and 10

Petitioner supports its challenges with the Declaration of Scott Andrews (Ex. 1008).

Patent Owner supports its Patent Owner Response with the Declarations of Christopher Wilson (Exs. 2007, 2016).

II. DISCUSSION

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable construction standard). Under that standard, and absent any special

³ Ex. 1004, U.S. Patent No. 5,289,183 (Feb. 22, 1994) (“Hassett '183”)

⁴ Ex. 1006, U.S. Patent No. 5,086,389 (Feb. 4, 1992) (“Hassett '389”)

definitions, we give claim terms their ordinary and customary meaning, as would have been understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Claim terms need only be interpreted to the extent necessary to resolve the controversy. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

1. Preambles of Claim 1 and Claim 6

Claim 1 recites, *inter alia*, “[a] vehicle occupancy monitoring system wherein a claim is made by a registrant about the number of occupants in a vehicle as it traverses a designated section of highway.” Ex. 1001, 3:26–28. Claim 6 recites, *inter alia*, “[a] method of receiving claimed vehicle occupancy data about a vehicle by a registrant, and also identifying the registrant as the vehicle traverses a designated section of the highway.” *Id.* at 4:13–16.

According to Petitioner, “the preambles of both independent claims are non-limiting” and “as a district court may construe preambles as non-limiting, the Board should examine the Challenged Claims on *inter partes* review as if the preambles are non-limiting.” Pet. 5; *see* Reply 2. In our Institution Decision, we preliminarily determined that neither the preamble of claim 1 nor the preamble of claim 6 is limiting. Inst. Dec. 8.

Patent Owner addresses the preamble of claim 1. PO Resp. 11–12. First, Patent Owner argues that the preamble provides antecedent basis for “registrant.” *Id.* at 12. Second, Patent Owner argues that the preamble of claim 1 “also makes clear that the ‘system’ or ‘program’ with which the registrant registers is one in which a registrant may make an occupancy claim.” *Id.* Patent Owner also asserts that “[w]hether or not the preamble is considered ‘limiting’ from MTA’s perspective, it is undoubtedly important to claim interpretation.” *Id.*; *see*

Tr. 37:11–14. At oral argument, we attempted to clarify Patent Owner’s position on whether the preambles of claims 1 and 6 are limiting:

JUDGE WARD⁵: I assume it is your position that the preamble is limiting, correct?

MR. ANGELL: Judge Ward, I would say that that is our position, but it’s not necessary that we prevail on that position because the claim still must be interpreted in the context -- or the term must be interpreted in the context of the claim in which it appears, and it’s appropriate in all cases to consider what’s in the specification -- or, excuse me, what’s in the preamble. So whether the preamble is considered limiting or not, the preamble is still important to interpretation of the terms in the claim.

JUDGE WARD: So would you agree then with the theoretical -- the statement that the theoretical deletion of the preamble would not affect the structure of Claim 1? Do you agree with that statement?

MR. ANGELL: I would say that it doesn’t affect the structure of what follows, but the preamble is an integral part of the claim. So whether it could be deleted without totally disrupting the claim, I think that’s hard to say.

The preamble certainly has substance and it must be used to interpret the claim. To be honest, I haven’t considered whether deleting it would totally disrupt the structure of the claim, but it is an integral part of the claim.

* * *

JUDGE BRADEN: So would you say that the preamble breathes life into the body of the claim?

MR. ANGELL: Yes, I would, Your Honor.

Tr. 40:12–41:19.

⁵ Judge Ward left the Board after oral argument. Judge McKone has replaced Judge Ward.

As we discussed in our Decision to Institute, “a preamble generally is not limiting when the claim body describes a structurally complete invention such that deletion of the preamble phrase does not affect the structure or steps of the claimed invention.” *Catalina Marketing Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 809 (Fed. Cir. 2002).

Even though the preamble provides antecedent basis for the claim term “registrant,” deleting the preamble would not affect the structure of the invention recited in claim 1. The body of claim 1 not only defines a structurally complete vehicle occupancy monitoring system with a transmitter, a sending transponder, and a reading data collector, but the body of the claim substantially overlaps with the recitation of the preamble (*compare* Ex. 1001, 3:26–28, *with id.* at 3:29–37). Similarly, the body of claim 6 describes a complete process and also substantially reiterates the preamble; “receiving the claim by a registrant as to number of occupants in a vehicle and reading the signal from the vehicle that identifies the registrant as the vehicle transits the designated section of highway” (*compare id.* at 4:13–16, *with id.* at 4:22–25).

Furthermore, we disagree that the preamble of claim 1 specifies the connection that Patent Owner argues above, that is, a connection between the claimed “system” and “registrant,” at least because it does not specify an act of registering a program. *See* PO Resp. 12. We further do not agree that the preamble of claim 1 recites a program, nor do we agree that the claimed “system” could be interpreted as a program, as Patent Owner argues, because the system of claim 1 recites at least one tangible claim element, the “sending transponder.” *Id.*

Based on the arguments and evidence adduced at trial, we maintain our conclusions that the preambles of claims 1 and 6 are not limiting.

2. “registrant”

Patent Owner contends that the broadest reasonable construction of the claim term “registrant” is “a person or entity that has registered with a plan or procedure that enables uniquely identifiable registered users to make vehicle occupancy claims.” PO Resp. 18 (citing Ex. 2007 ¶ 22). In support of its construction, Patent Owner cites portions of the ’101 patent claims, specifically, claim limitations relating to transmitting and receiving vehicle occupancy claims. *See id.* at 18–19 (citing Ex. 1001, [57], 1:59–61, 3:6–7, 3:26–28, 4:13–14, 4:17–18, 4:22–23; Ex. 2007 ¶ 22).

Patent Owner argues that our preliminary construction of “registrant” is “flawed because it refers to a generic ‘program,’ and does not account for the use of the term in the context of the claims.” *Id.* at 20; *see id.* at 21. Patent Owner further argues that “the ’101 Patent does not reference registering one’s vehicle, and the claimed ‘registrant’ should not be broadly construed to encompass such.” *Id.* at 20.

In its Petition, Petitioner argued that “[u]nder a broadest reasonable interpretation[,] the driver (or anyone else in the car with access to the device interface) could be the claimed ‘registrant’ ‘claiming’ the number of occupants,” and that this term is “not only limited to the particular person who had actually registered with the program administrator.” Pet. 8 (citing Ex. 1008 ¶ 103). We determined preliminarily in the Decision to Institute that Petitioner’s construction of “registrant” was overly broad because it eliminates the requirement that a person had registered at all. *See* Inst. Dec. 10 (citing Pet. 8). In its Reply, Petitioner argues that Patent Owner’s construction of “registrant” is “unsupported because there is nothing in the specification to suggest that the registrant is an ‘entity’ and not an individual.” Reply 3. Petitioner further argues that “neither claim 1 or 2 is

limited to claims made by a registrant.” *Id.* at 2 (citing Ex. 1001, 3:29–30, 3:40–43, 4:17–18, 4:26–29).

We are charged with interpreting claim terms according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b). Additionally, when construing claim terms, we “should also consult the patent’s prosecution history in proceedings in which the patent has been brought back to the [U.S. Patent and Trademark Office] for a second review.” *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015). Yet, we must be careful not to import limitations into the claims improperly or to read a particular embodiment appearing in the written description into the claim, if the claim language is broader than the embodiment. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). In *SuperGuide Corp. v. DirectTV Enterprises, Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004), our reviewing court held:

[t]hough understanding the claim language may be aided by the explanations contained in the written description, it is important not to import into a claim limitations that are not a part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment.

As we noted in our Institution Decision, the claim term “registrant” is not defined in the specification of the ’101 patent with the requisite deliberateness, clarity, and precision. Inst. Dec. 9; *see In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (“Although an inventor is indeed free to define the specific terms used to describe his or her invention, this must be done with reasonable clarity, deliberateness, and precision,” and when a term is given an uncommon meaning, the uncommon definition must be set out within the patent disclosure.). A number of the citations proffered by Patent Owner in its Response do not constitute a

definition for “registrant,” in part because such references are circular in nature. *See* PO Resp. 18.

The ’101 patent describes a “system [that] determines if a qualified ride-sharing event has occurred, and if so it will then provide for distribution of the program incentives to the registered individual(s)” and further, that “[a] driver who anticipates being able to participate in QREs would register with the agency (the program administrator).” Ex. 1001, [57], 1:59–61; *see also id.* at 2:48–50, 3:6–7 (describing a data packet consisting of an identifier that uniquely identifies the registrant and further describing how a “driver would, upon registration, acquire a number of these devices uniquely identifying the registrant”). While illustrative, these disclosures in the ’101 patent do not provide an explicit definition.

The claims recite language broader than that of the disclosures cited by Patent Owner. *See Van Geuns*, 988 F.2d at 1184. We are not persuaded by Patent Owner’s arguments to construe the term “registrant” to refer to a specific, instead of a generic, program so as to exclude registering one’s vehicle because Patent Owner’s construction impermissibly imports limitations from the specification. *See* PO Resp. 20; *see Van Geuns*, 988 F.2d at 1184; *see* Inst. Dec. 10–11. We further disagree with Patent Owner that the construction of “registrant” should be revised to account for its use in the claims because we agree with Petitioner that the body of claim 1 does not require the registrant to have made the “claim as to the number of occupants in the vehicle” and claim 6 does not impose any further limitations on the registrant itself. *See* Reply 2. We also decline to consider whether “registrant” could refer alternatively to an entity and a person because it is not necessary to resolve the controversy before us. *See id.* at 3; *see Vivid Techs.*, 200 F.3d at 803.

Because the specification of the '101 patent does not define explicitly the term “register” or “registrant,” we refer to the ordinary and customary meaning of these terms, as would have been understood by one of ordinary skill in the art in the context of the entire disclosure. *See Translogic Tech., Inc.*, 504 F.3d at 1257. To determine the ordinary and customary meaning of the terms, we refer to its dictionary definition. The dictionary definition for the term “register” is “to enter in or as in a record or list; enroll or record official” and definition for the term “registrant” is “a person who registers.” *Webster’s New World College Dictionary 4th Edition*, 1999 (Ex. 3001, 4). In our Institution Decision, we concluded that the claim term “registrant” encompasses a person who has registered their vehicle or enrolled in a program. Inst. Dec. 10–11. Registering one’s vehicle constitutes *recording officially* the ownership of the vehicle, such as with a state department of motor vehicles, consistent with the dictionary definition of register set forth above.

Based on the arguments and evidence adduced at trial, we are not persuaded to deviate from our preliminary construction of the claim term “registrant.”

3. “*program administrator*”

According to Patent Owner, the broadest reasonable construction for the claim term “program administrator” is ““a person or agency that administers a plan or procedure that enables a registrant to make vehicle occupancy claims as they are traversing a designated section of highway.”” PO Resp. 14 (citing Ex. 2007 ¶ 21). Patent Owner bases its proffered construction on disclosures relating to the ridesharing incentive program discussed above in Section II.A.1. *Id.* at 14–16 (citing Ex. 1001, [54], [57], 1:26–29, 1:51–56, 1:59–61, 2:9–12, 3:31–33). Patent Owner argues that our “preliminary construction is not within the broadest reasonable interpretation of ‘program administrator’ because it does not account for the context of the use of the term in Claim 1” and further, is “not consistent

with the teachings of the '101 Patent more generally as understood by one of ordinary skill in the art.” *Id.* at 16–17.

Petitioner does not proffer a construction for the “program administrator.” *See generally* Pet.

Here again, we note that the claim term “program administrator” is not defined in the specification of the '101 patent with the requisite deliberateness, clarity, and precision. *See Paulsen*, 30 F.3d at 1480. As discussed above, the '101 patent equates a program administrator with an agency: “[a] driver who anticipates being able to participate in QREs would register with the agency (the program administrator).” Ex. 1001, 1:59–61; *see also id.* at 1:54–57 (describing determining, by an agency, what is deemed to be a QRE and publishing, by the agency, a schedule defining the QRE). We do not agree that there is any inconsistency between our construction for “program administrator” and its disclosure in the '101 patent as being equivalent to an agency. *See id.* Accordingly, we are not persuaded that the claim term “program administrator” requires an entity or agency to administer a particular type of program, for example, a ridesharing program. Patent Owner’s construction is overly narrow as it impermissibly imports limitations from the specification. *See Van Geuns*, 988 F.2d at 1184. Furthermore, we disagree with Patent Owner that our construction of “program administrator” does not account for the context of the term’s usage in claim 1 because claim 1 recites “program administrator” only once, as an indirect object of the claimed “code,” and does not recite any limiting features of the program administrator itself. *See* PO Resp. 16.

Because the specification of the '101 patent does not define explicitly the term “program administrator,” we refer to its ordinary and customary meaning, as would have been understood by one of ordinary skill in the art in the context of the

entire disclosure. *See Translogic Tech., Inc.*, 504 F.3d at 1257. The dictionary definition for the term “program” is “a plan or procedure for dealing with some matter.” *Webster’s New World College Dictionary 4th Edition*, 1999 (Ex. 3001, 5). In our Institution Decision, we preliminarily concluded that the claim term “program administrator” encompasses an entity or person that administers a plan or procedure for dealing with some matter. Inst. Dec. 12.

Based on the arguments and evidence adduced at trial, we are not persuaded to deviate from our preliminary construction of the claim term “program administrator.” Accordingly, we determine that the term “program administrator” encompasses “an entity or person that administers a plan or procedure for dealing with some matter.”

B. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity

. . . the evidence that supports the grounds for the challenge to each claim’’)). The burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

Thus, to prevail in an *inter partes* review, Petitioner must explain how the proposed combinations of prior art would have rendered the challenged claims unpatentable. We analyze the challenges presented in the Petition in accordance with the above-stated principles.

C. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. “The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991).

Petitioner’s Declarant, Mr. Andrews, testifies that a person of ordinary skill in the art relevant to the ’101 patent “would have a Bachelor of Science in Electrical or Computer Engineering or the equivalent, plus two years of experience with automated toll roads, intelligent transportation systems, RFID tracking systems, or similar experience.” Ex. 1008 ¶ 49. Patent Owner does not offer any contrary explanation regarding who would qualify as a person of ordinary skill in

the art relevant to the '101 patent and indicates that it “does not disagree with [Petitioner’s] definition.” PO Resp. 9.

Based on the arguments and evidence adduced at trial, we see no reason to modify our decision to adopt and apply Petitioner’s definition of a person of ordinary skill in the art at the time of the claimed invention.

D. Asserted Challenges Based on Hassett '183 Alone

Petitioner contends claims 1, 3, 6, and 8 of the '101 patent are unpatentable under 35 U.S.C. § 103 as obvious over Hassett '183. Pet. 6–21. Patent Owner disputes Petitioner’s contentions in its Patent Owner Response. PO Resp. 21–42. The burden, however, remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378. For reasons that follow, we determine Petitioner has demonstrated by a preponderance of evidence the unpatentability of claims 1, 3, 6, and 8 over Hassett '183.

1. Overview of Hassett '183

Hassett '183 is directed to a “Traffic Monitoring and Management Method and Apparatus” and discloses “utilizing a microprocessor-based, read-write vehicle borne transponder device.” Ex. 1004, [54], [57]. Hassett '183 discloses that the vehicle-borne transponder includes “a radio frequency receiver and transmitter, a memory and a data processor.” *Id.* at 2:38–41. Hassett '183 further discloses that vehicle data, such as the number of axles, number of passengers, and vehicle class, is entered into the vehicle-borne transponder by a vehicle operator via a keypad interface. *Id.* at 5:28–32.

As a vehicle traverses a roadway, transceivers spaced along the roadway collect information regarding a number of passengers in the vehicle from the vehicle-borne transponder. *Id.* at [57]. Hassett '183 discloses that the

vehicle-borne transponder transmits “processed and unprocessed information, together with an identifying signal for the transponder” that stores this information, back to an interrogating roadway transceiver. *Id.* at 2:48–51. In addition to the number of passengers, this information may include a vehicle identification number (VIN) for the vehicle. *See id.* at 10:31–36.

Hassett ’183 further discloses that the vehicle-borne transponder transmits and receives information packets. *Id.* at 7:38–39. The information packets include, for example, a current date and time stamp that “can be included in either a transmission from a roadway transceiver to a vehicle transponder or from a vehicle transponder to a road[way] transceiver.” *Id.* at 8:1–4. The roadway transceivers are coupled to a central data processor station. *Id.* at 2:51–53. The central data processor station can utilize the information packets to perform traffic analysis. *Id.* at 2:53–61. Hassett ’183 also describes toll determination as an application of the vehicle-borne transponder. *See id.* at 2:65–3:3.

2. Analysis of Obviousness Challenge Based On Hassett ’183 Alone

a. Claim 1

(1) Claim 1 recites “a transmitter that transmits a claim as to the number of occupants in the vehicle”

Claim 1 recites, *inter alia*, “a transmitter that transmits a claim as to the number of occupants in the vehicle.” Ex. 1001, 3:29–30.

Petitioner’s Contentions

According to Petitioner, Hassett ’183 teaches this limitation because it “discloses [that] the driver enters information into the transponder via a keypad, such as the ‘number of passengers’” and that, “[a]s the vehicle traverses the roadway 128, the roadway transceivers interrogate the vehicle transponder to retrieve *this information* [(the number of passengers)] for traffic analysis.” Pet. 10

(citing Ex. 1004, 5:28–34) (internal quotation marks omitted). We further note Hassett ’183 discloses that the vehicle-borne transponder “includes a radio frequency receiver and transmitter” and “receive[s], store[s], process[es] and transmit[s] various information pertaining to a host vehicle’s use of the roadway.” Ex. 1004, 2:38–41, 3:54–56.

Having considered the question of patentability anew based on our review of the complete record, and in particular, based on the portions of Hassett ’183 cited by Petitioner and Mr. Andrews’s testimony in the Petition as well as the arguments and evidence adduced at trial, we are satisfied that Petitioner establishes sufficiently that the transmitter of the vehicle-borne transponder disclosed in Hassett ’183 transmits a claim as to the number of passengers. Thus, we are satisfied that Petitioner demonstrates, by a preponderance of the evidence, that Hassett ’183 teaches the “transmitter” recited in claim 1.

(2) Claim 1 recites “a sending transponder in the vehicle that transmits a code that uniquely identifies the registrant with the program administrator”

Claim 1 further recites, *inter alia*, “a sending transponder in the vehicle that transmits a code that uniquely identifies the registrant with the program administrator.” Ex. 1001, 3:31–33.

Petitioner’s Contentions

Petitioner contends that this limitation is met by Hassett ’183’s teaching of a “vehicle transponder [that] transmits a signal to roadside receivers that includes a ‘vehicle identification number.’” Pet. 11 (citing Ex. 1004, 10:31–36). Petitioner also contends that this limitation is met by Hassett ’183’s teaching of an identifying signal for the transponder that is transmitted by the vehicle transponder to the roadway transceivers. *Id.* (citing Ex. 1004, 2:48–51).

Petitioner contends the VIN “is a term of art for a number that uniquely identifies a vehicle, and is used when titling and registering a vehicle” and that, “[a]s registered property, the vehicle’s VIN also identifies the registrant of the vehicle.” Pet. 11 (citing Ex. 1008 ¶ 78). Petitioner’s Declarant, Mr. Andrews, testifies that “creation of a vehicle ‘title’ links the VIN of the vehicle to the license plate and registration tags of the vehicle, and to the identified vehicle owner(s).” Ex. 1008 ¶ 78. Petitioner takes the position that a vehicle owner that registers his or her vehicle would have been understood by an ordinarily skilled artisan to be, in many cases, the operator of his or her vehicle. *See id.*; *see* Pet. 7; *see* Ex. 2015, 39:3–6; *see* Reply 21. Thus, Petitioner cites Hassett ’183’s disclosure of a vehicle operator as teaching the registrant. Pet. 7.

Although Petitioner fails to identify where Hassett ’183 discloses expressly that the VIN uniquely identifies a registrant with a program administrator, Mr. Andrews also describes, as discussed above, the knowledge of one of ordinary skill in the art based on the background and state of the art of transponder-based tolling. Ex. 1008 ¶¶ 32–39. In his Declaration, Mr. Andrews cites U.S. Patent No. 7,237,715 (Ex. 1014, “Firestone”), which was filed on August 10, 2000, and discloses:

A method of collecting fees associated with vehicles for road usage wherein every vehicle contains its own unique identification code-similar or in concert with the known vehicle identification number (VIN)-comprised of a number, letter or symbol or combinations thereof. Vehicle code readers (fixed or mobile) that transfer data to a central agency, or other appropriate means, are placed in selected area: entrances and exits to specified bridges, tunnels and highways.

Ex. 1008 ¶ 38 (citing Ex. 1014, 2:1–15). Also in this section of the Declaration, Mr. Andrews cites U.S. Patent No. 6,966,489 (Ex. 1015, “Grant”), filed on January 7, 2002, which discloses

[t]he user of each vehicle is identified by the detection of a user identification device, such as [by] a[n] . . . electronic transponder mounted in the vehicle The toll collection system maintains a user identification register of users having an account with the operator of the toll road network Upon detection of the . . . electronic transponder mounted in the vehicle passing under a gantry, and the communication of identification information from the communication device to the toll collection system, a check is made in the user identification register to identify whether a corresponding user record exists. If a corresponding user record is found, a toll charge is calculated and the user debited for that toll charge.

Ex. 1008 ¶ 39; *see also id.* ¶ 34 (describing electronic toll collection including a tag that sends its ID to a roadside reader that either verifies a user account or deducts a fare from an onboard account, and further describing “several types of toll transaction management including systems where: ‘[t]he data stored is normally an ID which can be used to identify a user’s account status and other details which reside at a central database’”). Accordingly, Petitioner’s position is based on the disclosure of transponder-based tolling and the VIN in Hassett ’183, as well as the knowledge of the ordinarily skilled artisan, specifically, the knowledge that transponder-based tolling uses the VIN to uniquely identify registrants with a program administrator in order to collect toll fees. *See id.* ¶¶ 32–39; *see* Pet. 11 (citing Ex. 1008 ¶¶ 77–79).

In addition to the VIN discussed above, Petitioner cites Hassett ’183’s identifying signal for the transponder as teaching the “code” recited in claim 1. Pet. 11 (citing Ex. 1004, 2:48–51). Although Petitioner fails to identify where Hassett ’183 discloses expressly that the identifying signal uniquely identifies a registrant with a program administrator, Mr. Andrews testifies that Hassett ’183’s identifying signal would have been understood by the ordinarily skilled artisan to have been a unique identifier that distinguishes vehicles and that “a program administrator would have been able to identify the corresponding registrant from

the ‘identifying signal’” since it is unique to a particular vehicle and person.
Ex. 1008 ¶ 77; *see id.* ¶ 79.

In our Institution Decision, we determined that Mr. Andrews’s testimony and the factual evidence underlying his testimony were collectively persuasive to support Petitioner’s contention that Hassett ’183’s identifying signal for the vehicle-borne transponder and VIN would each have been understood by the ordinarily skilled artisan to uniquely identify a registrant with a program administrator. *See* Inst. Dec. 18, 21 (citing Pet. 11). We further determined that “although Petitioner’s Declarant does not testify as to specific supporting evidence, Mr. Andrews nonetheless sets forth the level of skill in the art based on the description of the background and state of the art and his own experience with respect to toll collection and enforcement.” *Id.* at 36 (citing Ex. 1008 ¶¶ 32–39 (discussing, among others, Grant and Firestone)).

Having considered the question of patentability anew based on our review of the complete record, and in particular, based on the portions of Hassett ’183 cited by Petitioner and Mr. Andrews’s testimony in the Petition and the arguments and evidence adduced at trial, we agree with Petitioner that one of ordinary skill in the art would have understood that the vehicle operator (i.e., driver) disclosed in Hassett ’183 would, in some cases, be a registered owner of a vehicle, and thus, we are satisfied that Petitioner establishes sufficiently that Hassett ’183 teaches the “registrant” recited in claim 1. *See* Pet. 7; *see* Ex. 1008 ¶ 78; *see* Ex. 2015, 39:3–6; *see* Reply 21. We further agree with Petitioner that the teachings of the VIN and identifying signal disclosed in Hassett ’183, when considered in light of the background and state of the art, would have been understood by the ordinarily skilled artisan to disclose (implicitly) a licensing authority with which a vehicle is registered and a program administrator for automatic tolling systems, thus

mirroring the two types of registration discussed above in Section II.A.3. *See* Pet. 11–13 (citing Ex. 1008 ¶¶ 32, 34, 77–79); *see* Ex. 1008 ¶¶ 32–39; *see* Ex. 2015, 67:7–19. Thus, we are satisfied that Petitioner establishes sufficiently that Hassett ’183 teaches the “program administrator” recited in claim 1.

We are also satisfied that Petitioner establishes sufficiently that the disclosure of a VIN and an identifying signal for the vehicle-borne transponder in Hassett ’183 teaches the “code” recited in claim 1. We credit the testimony from Mr. Andrews that the VIN identifies indirectly the registered vehicle owner via the vehicle title and the factual evidence cited in paragraphs 32 through 39 of Mr. Andrews’s Declaration. *See* Ex. 1008 ¶ 78. We further credit his testimony that the transponder identifying signal (which can encompass the VIN) would be unique at least because it encompasses the VIN, through which a registered owner could be identified. Reply 18 (citing Ex. 2015, 62:20–63:1, 73:16–18, 86:16–20).

In view of the above, we are satisfied that Petitioner demonstrates, by a preponderance of the evidence, that Hassett ’183 teaches the “sending transponder” as recited in claim 1.

Patent Owner’s Contentions

First, Patent Owner contends that it would not have been obvious to modify Hassett ’183 to teach a registrant, program, program administrator, or the claimed “code.” PO Resp. 29, 30, 34, 40–41 (citing Ex. 2007 ¶¶ 31, 32, 44–46). Second, Patent Owner contends that the VIN disclosed by Hassett ’183 does not teach or suggest the claimed “code” because it does not identify a registrant or roadway users, nor would it be obvious to use it for such identification. *Id.* at 29, 37 (citing Ex. 2007 ¶¶ 36–39). Third, Patent Owner contends that it would not have been obvious to replace Hassett ’183’s identifying signal for the transponder with the claimed “code.” *See id.* at 31–32. In support of its first three contentions, Patent

Owner argues that our Institution Decision rejected Petitioner’s argument that Hassett ’183’s identifying signal for the transponder or VIN discloses expressly or inherently the claimed “code.” *Id.* at 26, 29 (citing Inst. Dec. 25–27). More particularly, Patent Owner argues that we rejected the argument about the “code” because Hassett ’183 does not disclose any registrant, registration, or program administrator. *Id.*

Fourth, Patent Owner contends that Mr. Andrews’s own experience with toll collection and enforcement is not relevant to what one of ordinary skill in the art would have known or done. *See* PO Resp. 48 (arguing expert need not be POSITA but must opine on what POSITA would have known). Fifth, Patent Owner contends that the Grant reference was not submitted, cited, or discussed in the Petition. *Id.* at 33. Lastly, Patent Owner contests the use of the Firestone reference in the background and state of the art of section of Mr. Andrews’s Declaration and argues that the invention described in Firestone was not known in the art because it was disclosed as being “inventive.” *Id.* at 38. In support of its last contention, Patent Owner further argues that we cannot rely on Firestone because Petitioner did not present it as part of a ground for challenge. *Id.* at 39.

Analysis of Patent Owner’s Contentions

Initially, we note that each of Patent Owner’s first three contentions cite our findings with respect to anticipation, not obviousness. *See* Inst. Dec. 25–27. In our Institution Decision, we found that the claimed “code” was not shown to be disclosed expressly or inherently in Hassett ’183. *Id.* at 25–26. We did not, however, base that finding on a lack of *teaching* in Hassett ’183 of a registrant or program administrator. To the contrary, we found that Hassett ’183 teaches or suggests these claim elements. Inst. Dec. 17–20. We disagree with Patent Owner’s characterization of Petitioner’s challenge as one that modifies Hassett

'183 to add claim elements (e.g., registrant, program administrator, code) that are wholly absent from its teachings, instead of one that is based on what the ordinarily skilled artisan would have understood to be taught or suggested by Hassett '183. *See* PO Resp. 29 (arguing that Petitioner “presented no evidence as to why it would have been obvious to modify Hassett '183 to include the features the Board found absent”).

“Registrant”

In support of its first contention, Patent Owner asserts, “[a]s the Board stated, a ‘driver’ cannot be the claimed ‘registrant’ because that eliminates the requirement that a person has registered at all.” PO Resp. 42 (citing Inst. Dec. 10). Patent Owner mischaracterizes our earlier determination. We were *not* persuaded by Petitioner’s argument that the registrant can be someone who has not actually registered. Inst. Dec. 10. Rather, we acknowledged the existence of two different types of registration—registering one’s vehicle (e.g., such as with a state department of motor vehicles) and enrolling in a program, and concluded that “registrant” encompasses a person who has performed either type of registration. *Id.* at 10–11; *supra* § II.A.2.

We are not persuaded by Patent Owner’s assertion that the claimed “registrant” does not encompass the operator of a vehicle (i.e., driver) as taught by Hassett '183, because we agree with Petitioner that Patent Owner’s assertion is based on an unadopted and unduly narrow construction for the claim term “registrant.” *See* Reply 18. According to our claim construction discussed above in Section II.A.2, the claim term “registrant” is not limited to a person who registers for a ridesharing program or a program for making vehicle occupancy claims. We agree with Petitioner that one of ordinary skill in the art would have understood that the vehicle operator (i.e., driver) disclosed in Hassett '183 would,

in some cases, be a registered owner of a vehicle. *See* Pet. 7; *see* Ex. 1008 ¶ 78.

We credit the testimony of Petitioner's Declarant, Mr. Andrews, who testifies that

If Hassett '183 is being used in a vehicle driving on a public road, that vehicle would be registered and the -- at a minimum, the vehicle would be registered with the licensing authority, and the VIN would be the mechanism by which that would be effective. Now, you could have also registered the transponder in order to pay tolls and other things. So there are a variety of ways in which one could register. And the '101 patent doesn't make any explicit -- certainly under the construction, doesn't make any explicit requirements about whom one has registered with.

Ex. 2015, 67:7–19; *see id.* at 39:3–6. In his testimony, Patent Owner's Declarant, Mr. Wilson, acknowledges that the vehicle operator or driver is, in some cases, the vehicle's owner. *See* Ex. 1016, 121:1–17. Mr. Wilson testifies as follows:

MR. AUCHTER: Then what was the basis for your statement that it's not always true that a vehicle's owner is also the driver/vehicle operator? Was it because of leases?

MR. WILSON: No. It was because I believe many times the vehicle driver is not the vehicle owner. I don't know if that's 50 percent of the time or 95 percent of the time, but --

MR. AUCHTER: Or 10 percent of the time?

MR. WILSON: Or 10 percent of the time. It certainly would be a significant percentage. And, again, depending on how you define "vehicle owner," e.g., is my wife and I -- am I the owner of her car or -
-

MR. AUCHTER: In the '101 patent, does the registrant have to be the person driving the car?

MR. WILSON: No, the registrant would not have to be driving the car.

Id.

“Program Administrator”

We also did not adopt Patent Owner’s proffered construction for “program administrator.” *Supra* § II.A.3. Rather, we construed “program administrator” to refer to a generic program. *Id.* We agree with Petitioner’s contention, which is supported by Mr. Andrews’s testimony, that the teachings of the VIN and identifying signal disclosed in Hassett ’183, when considered in light of the background and state of the art, would have been understood by the ordinarily skilled artisan to disclose (implicitly) a licensing authority with which a vehicle is registered and a program administrator for automatic tolling systems, thus mirroring the two types of registration discussed above in Section II.A.3. *See* Pet. 12–13 (citing Ex. 1008 ¶¶ 32, 34, 79); *see* Ex. 2015, 67:7–19. Specifically, Mr. Andrews testifies that

If Hassett ’183 is being used in a vehicle driving on a public road, that vehicle would be registered and the -- at a minimum, the vehicle would be registered with the *licensing authority*, and the VIN would be the mechanism by which that would be effective. Now, you could have also *registered the transponder in order to pay tolls* and other things. So there are *a variety of ways in which one could register*. And the ’101 patent doesn’t make any explicit -- certainly under the construction, doesn’t make any explicit requirements about whom one has registered with.

Ex. 2015, 67:7–19 (emphases added).

“Code”

With regard to Patent Owner’s second contention, Patent Owner takes the position that the VIN disclosed in Hassett ’183 cannot teach or suggest the claimed “code” because the VIN’s 17 alphanumeric characters do not *directly* identify the registrant and instead, but only identify the vehicle itself and the type of vehicle. *See* PO Resp. 34–36; *see also* Prelim. Resp. 32 (arguing that the VIN does not identify a registrant because “there is no space in the VIN for information about

the owner or user of the vehicle.”). Mr. Wilson’s testimony, however, recognizes that the VIN *indirectly* identifies the registrant:

MR. AUCHTER: So is it the code that is the registrant’s identification information in claim 1?

MR. WILSON: No. The code would be a index, if you will, that uniquely identifies that registrant and associates the registrant with other data that may have been stored as a part of the program.

* * *

MR. AUCHTER: Can a VIN be used to cross-reference to an individual?

MR. WILSON: Not normally.

MR. AUCHTER: Can a VIN be used to cross-reference to an individual if you had access to the DMV registration number?

MR. WILSON: Assuming that individual was in the DMV registration database and you had access to that database, you could do the cross-reference, but both of those are significant assumptions.

Ex. 1016, 93:12–17, 126:14–23.

Patent Owner’s argument supporting its second contention is not persuasive because it is not commensurate in scope with the challenged claims. Neither claim 1 nor claim 6 requires the “code” to *directly* identify the registrant. As we determined in our Institution Decision, “the ‘code’ recited in claim 1 is not limited to directly identifying the owner or user of the vehicle, and instead encompasses indirectly identifying this person using, for example, a database or lookup table.” Inst. Dec. 21. Petitioner takes the position that the VIN disclosed in Hassett ’183 teaches the claimed “code” recited in claims 1 and 6 because it would “be used as an index in a database or program.” Reply 12. We credit the testimony of Petitioner’s Declarant, Mr. Andrews, who testifies that “a vehicle owner would

register their vehicle, and that registration would link the vehicle license number, the vehicle identification number, and the identity of the registered owner of the vehicle” and that the VIN would be “linked to information about the owner” so as to “*indirectly* identify the owner.” Ex. 2015, 33:20–34:3, 34:23–35:1 (emphasis added); *see id.* at 39:17–21 (“any time a driver is driving the vehicle that is registered in their name, the VIN represents the identity of the owner in the same way that their Social Security number would represent the identity of the owner”); *see id.* at 60:20–22.

Also in support of its second contention, Patent Owner distinguishes the traffic monitoring system and method disclosed in Hassett ’183 on the basis that it “simply has no need to know, or use for, information identifying particular ‘registrants’ with the system” and that it “it goes out of its way to *not* collect information about drivers on the roadway.” PO Resp. 26, 27; *see id.* at 33. In its Patent Owner Response, Patent Owner presents a hypothetical example for a household having three transponders associated with a single registrant. PO Resp. 27. Patent Owner argues that, even if all three transponders were travelling along the same roadway at the same time, only one registrant could be identified and thus, Hassett ’183 could not be modified to uniquely identify registrants. *Id.*

We do not agree that uniquely identifying registrants is contrary to achieving the objectives of Hassett ’183. *See* PO Resp. 27. Irrespective of its stated objectives, we find that the disclosure of toll determination and toll collection in Hassett ’183 would have taught or suggested, to one of ordinary skill in the art, uniquely identifying the registrant at least for the purpose of completing a tolling transaction. *See* Ex. 1004, 1:6–14, 2:65–3:3.

Furthermore, Patent Owner’s argument premised on its hypothetical example is not commensurate in scope with the challenged claims. *See* PO Resp.

27. Neither independent claim 1 nor independent claim 6 requires a one-to-one correspondence between a transponder and a registrant. Moreover, the challenged claims do not exclude the hypothetical example because claim 1 only requires that the code uniquely identify a registrant, not a transponder. Claim 6 recites, *inter alia*, “a signal from the vehicle that identifies the registrant” and as such, does not require the same unique identification as claim 1.

Also with regard to Patent Owner’s second contention, Patent Owner presents an argument about the danger of entering the VIN disclosed in Hassett ’183 while the driver traverses the highway. PO Resp. 39. Although claim 1 recites “[a] vehicle occupancy monitoring system wherein *a claim is made by a registrant about the number of occupants in a vehicle as it traverses a designated section of highway,*” we determined that the preamble of claim 1 is not limiting. *Supra* § II.A.1. Accordingly, Patent Owner’s argument is unpersuasive as it is not commensurate in scope with the claims. Moreover, we note that Petitioner cited Hassett ’183’s VIN as teaching the “code” recited in the body of claim 1, not the “claim” recited in its preamble. *See* Pet. 11. Even if we were to give patentable weight to the preamble of claim 1, Patent Owner’s argument is not persuasive because it does not address the danger of entering “a claim . . . about a number of occupants,” which would have fewer than the 17 characters in the VIN, by a registrant as the vehicle traverses the highway.

With regard to Patent Owner’s third contention, Patent Owner argues that Whether the identifying signal “teaches” “encompasses” or “is” the claimed code *is not relevant to the obviousness inquiry* because the Board ultimately found that the claimed “code that uniquely identifies the registrant” was missing from Hassett ’183. *See* Institution Decision at 25–27 (*rejecting anticipation challenge over Hassett ’183*). Thus, the Board’s preliminary findings regarding the identifying signal (as well as the VIN) as “teaching” or “encompassing” the claimed code are

not tailored to the appropriate legal standard, which requires that a person having ordinary skill in the art *be motivated to modify a particular reference* in a manner that arrives at the patented invention. PO Resp. 32 (emphasis added). Thus, Patent Owner takes the position that, whatever Hassett '183 might teach or suggest with respect to an obviousness inquiry is irrelevant because of our determination in the anticipation inquiry. *See id.* In the present proceeding, we were not persuaded to institute Petitioner's anticipation challenge in part because Petitioner did not point to a portion of Hassett '183 that *explicitly* disclosed the VIN or the identifying signal in connection with a registrant or a program administrator. Inst. Dec. 25. However, we were also not persuaded because Petitioner did not demonstrate sufficiently that the "code" was *inherent*. *Id.* at 26. That is, Petitioner did not show that the ordinarily skilled artisan would have understood the VIN or the identifying signal to *necessarily* uniquely identify a registrant with a program administrator because the arguments and evidence presented did not eliminate the possibility that the VIN or the identifying signal would be used to instead determine a number of distinct vehicles traversing a designated stretch of the roadway. *Id.*; *see In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) ("Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.").

With regard to Patent Owner's fourth contention, Mr. Andrews's testimony regarding toll collection and enforcement is relevant at least because Mr. Andrew's expertise puts him in a position to testify as to what the hypothetical person of ordinary skill would have known generally. Ex. 1008 ¶¶ 5–20.

With regard to Patent Owner's fifth contention, in communications among the Board and the parties, we indicated that Grant was identified by number in Mr. Andrews's Declaration, that issued patents are easily accessible to the Board,

and that we were able to obtain Grant prior to mailing the Institution Decision. Although Grant was not specifically addressed in the Petition, Petitioner did point to the “State of the Art” section of Mr. Andrews’s Declaration in its Petition. *See* Pet. 12 (citing Ex. 1008 ¶¶ 32, 34, 79). Grant constitutes the underlying evidence supporting Mr. Andrews’s testimony, which Petitioner cited throughout its Petition. Mr. Wilson’s testimony also supports the finding that electronic toll collection, which is described in Grant, was known to those of ordinary skill in the art at the time of the invention:

MR. ANGELL: Was Electronic Toll Collection, ETC, systems well known in 2005?

MR. WILSON: Yes.

MR. ANGELL: Were ETCs well known in 1999?

MR. WILSON: Yes.

MR. ANGELL: Do you know when Electronic Toll Collection systems were first implemented?

MR. WILSON: I believe they were first implemented in the ’80s or by -- they were around and being used maybe even -- sometime in the early ’80s, something like that.

Ex. 1016, 40:18–22, 41:9–14, 143:5–144:11

With regard to Patent Owner’s last contention, we do not agree that describing a concept as “inventive” would preclude its use as prior art, either in a ground for challenge or to describe the state of the art at the time of the invention. *See* PO Resp. 38–39. Firestone was filed in 2000 and published in 2007 and therefore constitutes prior art to the ’101 patent under 35 U.S.C. § 102(e). Ex. 1014, [22], [45]. It is not improper to rely on Firestone to evidence the knowledge of one of ordinary skill in the art, as Mr. Andrews has done. As we discussed

above with respect to Grant, Firestone constitutes the underlying evidence supporting Mr. Andrews's testimony, which Petitioner cited throughout its Petition.

For the foregoing reasons, we are not persuaded by Patent Owner's contentions.

(3) Claim 1 recites "a reading data collector that can interrogate a vehicle within its range, and receive, store and transfer to a central processing facility said transmitted code identifying the registrant along with a time/date stamp"

Claim 1 further recites "a reading data collector that can interrogate a vehicle within its range, and receive, store and transfer to a central processing facility said transmitted code identifying the registrant along with a time/date stamp." Ex. 1001, 3:34–37.

Petitioner's Contentions

Petitioner contends that Hassett '183's disclosure of a roadside transceiver teaches the "reading data collector" and that the disclosure of a network management computer, alternatively termed a central data processor station, teaches the "central processing facility." Pet. 13. Petitioner further contends Hassett '183's roadside transceiver has a limited radio range, includes "data storage in the form of a memory element," and interrogates vehicle transponders. *Id.* (internal quotation marks omitted). According to Petitioner, information received by the roadside transceiver includes the identifying signal for the vehicle-borne transponder or the VIN. *Id.* Petitioner asserts that "Hassett '183 discloses that the roadside transceivers are coupled to a central data processor station so they can relay[] the information to the network management computer 128 for analysis." *Id.* at 13–14 (citing Ex. 1004, 2:51–61, 5:16–21) (internal quotation marks omitted). Petitioner further asserts that "Hassett '183 discloses providing

this date and time information to the network management computer.” *Id.* at 14 (citing Ex. 1004, 5:12–21).

Having considered the question of patentability anew based on our review of the complete record, and in particular, based on our review of the portions of Hassett ’183 cited by Petitioner and Mr. Andrews’s testimony in the Petition and the arguments and evidence adduced at trial, we are satisfied that Petitioner demonstrates, by a preponderance of the evidence, that Hassett ’183 teaches the “reading data collector” as recited in claim 1.

Patent Owner Contentions

Patent Owner disputes Petitioner’s contentions. First, Patent Owner contends that Hassett ’183 does not teach or suggest the claimed “time/date stamp” because there is no code, and because “[t]here is also no evidence that the time/date information transmitted in the traffic monitoring system of Hassett ’183 is verifiable in order to accurately process a toll charge.” PO Resp. 40. Second, Patent Owner contends that Hassett ’183 is a traffic monitoring and management system that serves to collect information for the purposes of study, and not to facilitate a tolling application. *Id.* at 46, 47 (arguing that “there is no evidence that the system described in Hassett ’183 would have been implemented in an HOV/HOT environment”).

Patent Owner’s first contention is not commensurate in scope with the claims. None of the challenged claims require collecting a toll, or verifying or accurately processing a toll charge. We are also not persuaded by Patent Owner’s first contention because, as discussed above, we maintain our finding that Hassett ’183 discloses the claimed “code.” We are satisfied that Petitioner establishes sufficiently that a “time/date stamp” is transmitted or transferred because Hassett ’183 discloses “a subsequent transceiver 120 signals the vehicle transponders

102'–106' to transmit the original time and date information that they received from the upstream transceiver 124. . . [and] [t]he transceiver 120 then . . . relays the information to the network management computer 128 for analysis.” Ex. 1004, 5:13–18. We also agree with Petitioner that Hassett '183 teaches the claimed “time/date stamp” because it is necessary to determine vehicle speed. Reply 20.

With regard to Patent Owner's second contention, although traffic monitoring may be one stated objective of Hassett '183, we find that Hassett '183 also teaches or suggests a tolling application. As we first noted in our Institution Decision, “Hassett '183 also describes toll determination as an application of the vehicle-borne transponder.” Inst. Dec. 15 (citing Ex. 1004, 2:65–3:3); *see* Ex. 1016, 119:3–5 (acknowledging teaching of toll determination by Patent Owner's Declarant).

We further agree with Petitioner that Hassett '183 “contemplates toll processing based on the number of passengers.” Reply 9–10 (citing Ex. 1004, 5:34–38) (“If the roadway is a toll road, the roadway transceivers can also communicate to the vehicle transponder which toll lane the vehicle operator should select for the fastest or most appropriate processing.”); *see also* Ex. 2015, 80:14–25 (Petitioner's Declarant's testimony that the disclosure of a transponder, VIN, and toll determination in Hassett '183 would have been understood to teach or suggest toll collection).

Furthermore, Hassett '183 is a continuation in part of U.S. Patent No. 5,144,553 entitled “Electronic Vehicle Toll Collection System and Method” and incorporates its subject matter by reference. Ex. 1004, 1:6–15; *see* Reply 10. Without even relying on the specific subject matter discussed in parent U.S. Patent No. 5,144,553, we find that Hassett '183 teaches or suggests a toll collecting application.

For the foregoing reasons, we are not persuaded by any of Patent Owner's contentions.

In view of the above, having considered the question of patentability anew based on our review of the complete record, and in particular, based on our review of the portions of Hassett '183 cited by Petitioner and Mr. Andrews's testimony in the Petition and the arguments and evidence adduced at trial, we are satisfied that Petitioner demonstrates, by a preponderance of the evidence, that Hassett '183 teaches the limitations recited in claim 1.

b. Claim 3

Claim 3 recites "wherein the said sending transponder also transmits the claimed number of vehicle occupants." Ex. 1001, 3:44–46.

Petitioner's Contentions

Petitioner asserts that "Hassett '183 discloses that the information transmitted by the vehicle transponder includes the 'number of passengers.'" Pet. 17 (citing Ex. 1004, 6:67–7:8). The cited portion of Hassett '183 discloses a number of passengers as information collected by the vehicle transponder. Ex. 1004, 7:2–6. Moreover, Hassett '183 discloses that the roadside transceiver "includes means for signaling said transponders to *transmit* an information signal indicative of *at least one of* said number of passengers . . . [and] vehicle identification number." *Id.* at 10:31–36 (emphasis added).

For the foregoing reasons, having considered the question of patentability anew based on our review of the complete record, and in particular, based on our review of the portions of Hassett '183 cited by Petitioner and Mr. Andrews's testimony in the Petition and the arguments and evidence adduced at trial, we are satisfied that Petitioner demonstrates, by a preponderance of the evidence, that Hassett '183 teaches the limitation recited in claim 3.

c. Claim 6

We determine that Petitioner’s arguments presented with respect to claim 1 are also persuasive with respect to the “transmitting” limitations of independent claim 6 for substantially similar reasons. Ex. 1001, 4:17–20.

Claim 6 further recites, *inter alia*, “and then receiving the claim by a registrant as to number of occupants in a vehicle and reading the signal from the vehicle that identifies the registrant as the vehicle transits the designated section of highway.” *Id.* at 4:22–25.

Petitioner’s Contentions

According to Petitioner, “the Hassett ’183 roadside transceivers receive the number of passengers (the claimed number of occupants) claimed by the driver (the claimed registrant).” Pet. 19 (citing Ex. 1008 ¶ 97) (internal quotation marks omitted). Petitioner also cites Hassett ’183’s disclosure of the following: “[a]s the vehicle traverses the roadway 128, the roadway transceivers interrogate the vehicle transponder to retrieve *this information* [(the number of passengers)] for traffic analysis.” *Id.* at 10 (citing Ex. 1004, 5:32–34) (internal quotation marks omitted). Petitioner contends that “the Hassett ’183 roadside transceivers read . . . [the] vehicle identification number . . . hence identifying the registrant” and that “this is all done as the vehicle of Hassett ’183 traverses a designated section of a roadway (*e.g.*, a toll road or highway).” *Id.* at 19–20 (citing Ex. 1008 ¶¶ 77–79, 96, 98). We further note that Hassett ’183’s roadside transceivers signal the transponders to transmit a signal indicative of the vehicle’s VIN. *See* Ex. 1004, 10:31–36.

Although Petitioner fails to sufficiently establish that Hassett ’183 discloses expressly that the signal indicative of the VIN is transmitted as the vehicle traverses the roadway, we determined, in our Institution Decision, that Petitioner

establishes sufficiently this feature to be taught implicitly in the cited teachings of Hassett '183 discussed above. *See id.*; *see* Pet. 19–20.

In view of the above, having considered the question of patentability anew based on our review of the complete record, and in particular, based on our review of the portions of Hassett '183 cited by Petitioner and Mr. Andrews's testimony in the Petition and the arguments and evidence adduced at trial, we are satisfied that Petitioner demonstrates, by a preponderance of the evidence, that Hassett '183 teaches the limitations recited in claim 6.

Patent Owner's Contentions

Patent Owner contends that Hassett '183 does not teach “transmitting the number of occupants in a vehicle claimed by a registrant” as recited in claim 6 because Hassett '183 does not teach a registrant. PO Resp. 41–42. We disagree that Hassett '183 does not teach or suggest the “transmitting” limitation set forth above because we are persuaded that Hassett '183 teaches a registrant, as we discussed above with respect to claim 1. Patent Owner further contends

It would not be obvious to implement registration with a “program” of independent claims 1 and 6. Indeed, Hassett '183 has no need to add such a program that is able to transmit and receive occupancy claims by program registrants because Hassett '183 is a “traffic monitoring and management” system and not a “vehicle occupancy monitoring system” designed to enable registrants to make claims about vehicle occupancy.

Id. at 42 (citing Ex. 2007 ¶¶ 44–46). Patent Owner's arguments are premised on unclaimed features because neither claim 1 nor claim 6 requires “implement[ing] registration with a ‘program’” nor does either claim require “a program that is able to transmit and receive occupancy claims by program registrants.” We further disagree, for the reasons discussed above with respect to claim 1, that Hassett '183 does not teach or suggest registrants making claims about vehicle occupancy.

d. Claim 8

Claim 8 recites “further comprising the transmission of number of occupants claimed by a registrant by a transponder that transmits a signal both identifying the registrant and the number of occupants claimed by that registrant.” Ex. 1001, 4:31–35.

Petitioner’s Contentions

Petitioner contends Hassett ’183 teaches or suggests this limitation. *See* Pet. 20–21. As discussed above with respect to claim 3, Hassett ’183 discloses “transceiver includes means for signaling said transponders to transmit an *information signal indicative of at least one of said number of passengers . . . [and] [a] vehicle identification number.*” Ex. 1004, 10:31–36 (emphasis added).

For the foregoing reasons, having considered the question of patentability anew based on our review of the complete record, and in particular, based on our review of the portions of Hassett ’183 cited by Petitioner and Mr. Andrews’s testimony in the Petition and the arguments and evidence adduced at trial, we are satisfied that Petitioner demonstrates, by a preponderance of the evidence, that Hassett ’183 teaches the limitation recited in claim 8.

E. Asserted Challenge Based on the Combination of Hassett ’183 and Hassett ’389

Petitioner contends claims 5 and 10 of the ’101 patent are unpatentable under 35 U.S.C. § 103 as obvious over the combination of Hassett ’183 and Hassett ’389. Pet. 51–54. Patent Owner disputes Petitioner’s contentions in its Patent Owner Response. PO Resp. 44–50. As noted above, the burden is on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378. For reasons that follow, we determine Petitioner has demonstrated by a preponderance of evidence the unpatentability of claims 5 and 10 over the combination of Hassett ’183 and Hassett ’389.

1. Overview of Hassett '389

Hassett '389 is incorporated by reference in Hassett '183 and is directed to an “Automatic Toll Processing Apparatus.” Ex. 1006, 1:7–15, [54]. Hassett '389 discloses a “system for automatic collection of tolls includ[ing] a toll facility, an in-vehicle toll processor having memory for storing a toll-money-available quantity purchased by the user, and a toll-facility-identification site.” *Id.* at [57].

Hassett '389 further discloses “a vertical array of ten indicator lights 112.” *Id.* at 13:30. “Each indicator light in the light array represents a different class of vehicle—bus, car, truck, or other.” *Id.* at 13:34–35. Hassett '389 discloses illuminating an indicator light corresponding to a vehicle-class identifier received from an in-vehicle component (“IVC”). *Id.* at 13:41–46. The illuminated indicator light indicates the vehicle class of the vehicle currently passing through the corresponding lane of the toll facility. *Id.* at 13:46–49. According to Hassett '389, “[e]nforcement personnel can then monitor the light column for each automated lane to confirm proper correspondence between [the] visually observed vehicle class and [the] vehicle class indicated by each IVC.” *Id.* at 13:49–53.

2. Analysis of the Challenge Based on Obviousness in View of Hassett '183 and Hassett '389

a. Claims 5 and 10

Claim 5 recites “a visual display of the number of claimed occupants that can be seen by an enforcement officer outside the vehicle as it traverses the highway.” Ex. 1001, 4:6–10. Claim 10 recites a substantially similar limitation. *Id.* at 4:41–44.

Petitioner's Contentions

According to Petitioner, Hassett '389 discloses “using a light array to visually display the claimed ‘vehicle class’” and contends “[e]nforcement personal

personnel (the claimed ‘enforcement officer’) can then visually observe the claimed ‘vehicle class’ and actual vehicle as it passes.” Pet. 51 (citing Ex. 1006, 13:28–56). Petitioner contends it would have been obvious to the ordinarily skilled artisan to combine the teachings of Hassett ’183 and Hassett ’389 because:

A POSITA would also have been motivated to modify the vehicle class display of Hassett ’389 for use in the system of Hassett ’183 so as to provide an enforcement mechanism for vehicle occupancy regulations in HOV lanes or occupancy-based toll roads. (Ex. 1008 ¶ 212). Such a combination would be no more than combining known elements to achieve predictable results. (Ex. 1008 ¶ 215).

Pet. 47. Mr. Andrews testifies that “[a] person of ordinary skill in the art would have found it obvious to use the light array of Hassett ’389 to visually display the claimed number of occupants of Hassett ’183, in place of or in addition to the different vehicle classes of Hassett ’389.” Ex. 1008 ¶ 214. Mr. Andrews further testifies that “[s]uch a combination would also have required only minor adaptations between the two systems, for example re-numbering the lights, and adapting the light control system to accept inputs as to the number of occupants instead of, or in addition to the vehicle class.” *Id.* ¶ 215; *see id.* ¶ 216.

For the foregoing reasons, having considered the question of patentability anew based on our review of the complete record, and in particular, based on our review of the Petition, the cited portions of Hassett ’183 and Hassett ’389, and Petitioner’s Declarant’s testimony, and having considered the arguments and evidence adduced at trial, we are satisfied Petitioner demonstrates, by a preponderance of evidence, that the combination of Hassett ’183 and Hassett ’389 teaches the limitations recited in claims 5 and 10.

Patent Owner’s Contentions

Patent Owner disputes Mr. Andrews’s testimony and contends “[t]he combination would not require ‘minor adaptations,’ but would require the

wholesale addition of a HOV tolling environment and an enforcement mechanism for such environment,” which is not sufficient to prove ‘predictable results.’” PO Resp. 48. Patent Owner further contends there is no motivation to combine Hassett ’183 and Hassett ’389 because neither reference has a teaching or suggestion to enforce vehicle occupancy restriction. *Id.* at 45. Lastly, Patent Owner contends “[e]nforcement officers would not be able to see the indicator lights as the vehicle ‘traverses the highway,’ but only at the toll facility.” *Id.* at 45, 50–51 (citing Ex. 2007 ¶¶ 50–54; Ex. 2015, 101:18–102:19).

Analysis of Patent Owner’s Contentions

With respect to Patent Owner’s first contention, the test for obviousness is not whether the features of one reference may be bodily incorporated into another reference. *In re Bozek*, 416 F.2d 1385, 1390 (1969); *In re Mapelsden*, 329 F.2d 321, 322 (1964). “[I]t is not necessary that the inventions of the references be physically combinable to render obvious the invention under review.” *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983). The relevant inquiry is whether the claimed subject matter would have been obvious to those of ordinary skill in the art in light of the *combined teachings* of those references. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981). “Combining the *teachings* of references does not involve an ability to combine their specific structures.” *In re Nievelt*, 482 F.2d 965, 968 (CCPA 1973). We disagree that the combination of Hassett ’183 and Hassett ’389 would require wholesale additions or be unpredictable because both Hassett ’183 and Hassett ’389 involve tolling, Hassett ’183 discloses making occupancy claims, and Hassett ’389 discloses vehicle class claims in connection with a visual display. We agree with Petitioner that it would have been obvious to use or modify Hassett ’389’s visual display to display occupancy claims instead of vehicle class.

With respect to Patent Owner’s next contention, under *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007), there is no need to find an explicit, implicit, or inherent teaching or suggestion in Hassett ’183 or Hassett ’389 in support of Petitioner’s rationale for combining. The Court in *KSR* specifically held that “a combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR*, 550 U.S. at 401. Here, Petitioner’s proffered rationale for combining Hassett ’183 and Hassett ’389 is consistent with this holding: “[s]uch a combination would be no more than combining known elements to achieve predictable results.” Pet. 45. Petitioner’s proffered rationale is supported by the testimony of its Declarant. *See* Ex. 1008 ¶¶ 212, 214–16. As Mr. Andrews testifies, “[a] person of skill in the art would have been motivated to combine Hassett ’389 and Hassett ’183 in this way to achieve the same type of enforcement capability for vehicle class violations as for occupancy violations.” *Id.* ¶ 215.

We do not agree with Patent Owner’s last contention because it is not commensurate in scope with claims 5 and 10. Although claims 5 and 10 recite “a visual display . . . [that] can be seen by an enforcement officer outside the vehicle as it traverses the highway,” neither claim limits “travers[ing] the highway” so as to exclude driving through a toll facility. Moreover, neither claim limits “travers[ing] the highway” to a particular distance or length of time. Furthermore, neither claim makes “seen by an enforcement officer” a requirement, but rather indicates the possibility that the visual display *can* be observed.

A. *Petitioner’s Motion to Exclude*

Petitioner timely filed Objections to Patent Owner’s Response Evidence (Paper 23), followed by a Motion to Exclude (Paper 28), to which Patent Owner filed an Opposition (Paper 30). Petitioner also filed a Reply in support of its

Motion to Exclude (Paper 31). Petitioner moves to exclude portions of the Wilson Declaration (Ex. 2007) on the grounds that Mr. Wilson's expert testimony lacks foundation, and lacks reference to underlying facts, and constitutes hearsay. Paper 28, 2-5. Even considering the objected portions of Exhibit 2007, we determine that Patent Owner's arguments and evidence do not outweigh the evidence of obviousness presented by Petitioner. As a result, we dismiss Petitioner's Motion to Exclude as moot.

III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence the unpatentability of claims 1, 3, 5, 6, 8, and 10 of the '101 patent.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1, 3, 5, 6, 8, and 10 of the '101 patent have been shown by a preponderance of the evidence to be *unpatentable*;

FURTHER ORDERED that Petitioner's Motion to Exclude Evidence is *dismissed* as moot; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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