

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

KAPSCH TRAFFICCOM IVHS INC. and
KAPSCH TRAFFICCOM HOLDING CORP.,
Petitioner,

v.

NEOLOGY, INC.,
Patent Owner.

Case IPR2015-00819
Patent 8,325,044 B2

Before JUSTIN T. ARBES, GLENN J. PERRY, and
TREVOR M. JEFFERSON, *Administrative Patent Judges*.

ARBES, *Administrative Patent Judge*.

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

I. BACKGROUND

Petitioners Kapsch TrafficCom IVHS Inc. and Kapsch TrafficCom Holding Corp. (collectively, “Petitioner”)¹ filed a Petition (Paper 1, “Pet.”) seeking *inter partes* review of claims 1–26 of U.S. Patent No. 8,325,044 B2 (Ex. 1004, “the ’044 patent”) pursuant to 35 U.S.C. §§ 311–319. On September 14, 2015, we instituted an *inter partes* review of claims 1–3, 7–12, 16–20, 23, and 24 on three grounds of unpatentability (Paper 13, “Dec. on Inst.”). Patent Owner Neology, Inc. filed a Patent Owner Response (Paper 23, “PO Resp.”), and Petitioner filed a Reply (Paper 31, “Reply”).² A combined oral hearing with Case IPR2015-00818³ was held on May 10, 2016, and a transcript of the hearing is included in the record (Paper 41, “Tr.”). We have jurisdiction under 35 U.S.C. § 6. This final written decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–3, 7–12, 16–20, 23, and 24 are unpatentable.

¹ The original Petitioners were Kapsch TrafficCom IVHS Inc., Kapsch TrafficCom IVHS Holding Corp., Kapsch TrafficCom IVHS Technologies Holding Corp., Kapsch TrafficCom U.S. Corp., and Kapsch TrafficCom Holding Corp. During trial, Kapsch TrafficCom IVHS Holding Corp., Kapsch TrafficCom IVHS Technologies Holding Corp., and Kapsch TrafficCom U.S. Corp. merged with Kapsch TrafficCom Holding Corp. See Papers 1, 34, 35.

² Petitioner filed redacted (Paper 33) and unredacted (Paper 31) versions of its Reply and other materials, along with two motions to seal, which were conditionally granted. See Papers 29, 34. We do not rely on any sealed material in this Decision.

³ The ’044 patent and U.S. Patent No. 8,587,436 B2, which was challenged in Case IPR2015-00815, are continuations of U.S. Patent No. 8,237,568 B2 (“the ’568 patent”), which is being challenged in Case IPR2015-00818.

A. The '044 Patent

The '044 patent describes a system for “verifying and tracking identification information” using “a radio frequency (RF) identification device, an identification mechanism (e.g., a card, sticker), and an RF reader/writer.” Ex. 1004, col. 1, ll. 32–46. The system facilitates electronic identification by reading data stored on the RF device (without having to contact the device) and verifying the data against known identification information. *Id.* at col. 2, ll. 30–57. The system also provides security by checking and validating security keys stored on the RF device before reading the data. *Id.* The '044 patent explains that the system can be used in a number of different applications, such as for “vehicle identification,” “border crossing solutions,” or “toll booths.” *Id.* at col. 10, ll. 20–62, Fig. 4.

Figure 2 of the '044 patent is reproduced below.

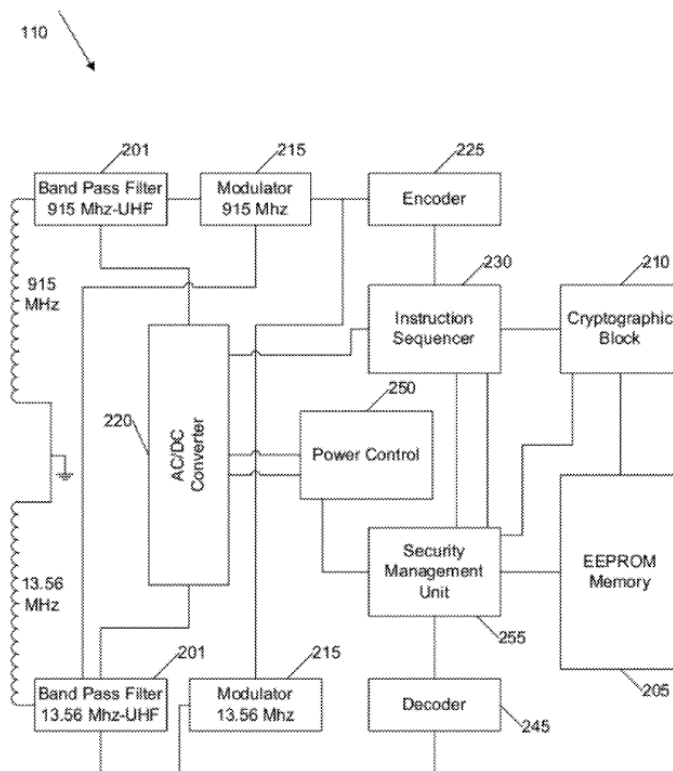


FIG. 2

As shown in Figure 2, dual frequency RF device 110 comprises modulator 215 that receives baseband signals from an antenna, security management unit 255, cryptographic block 210, and electrically erasable programmable read-only memory (EEPROM) memory 205 that stores data. *Id.* at col. 2, ll. 30–57, col. 20, ll. 42–51. RF device 110 receives security keys from an RF reader, and security management unit 255 “checks and validates” the keys to “grant or deny access to the memory chip.” *Id.* at col. 2, ll. 51–55.

B. Illustrative Claim

Challenged claims 1, 10, 19, and 23 are independent. Claims 1 and 10 recite limitations from the perspective of a radio-frequency identification (RFID) reader, whereas claims 19 and 23 recite limitations from the perspective of an RFID transponder. Claims 1 and 19 of the '044 patent recite:

1. A method for granting access to memory contents of an RFID transponder, the memory contents including an identifier, comprising:

 sending a first communication to the RFID transponder;

 sending a second communication to the RFID transponder that includes a security key for validation by the RFID transponder;

 receiving at least the identifier included in the memory contents in response to the second communication and as a result of validation of the security key; and

 comparing the identifier to an identifier stored in a database to determine if the two identifiers are related.

19. A method for granting access to memory contents of an RFID transponder, the memory contents including an identifier, comprising:

 receiving a first communication from a RFID reader;

receiving a second communication from the RFID reader that includes a security key;

granting access to the memory contents based on the security key; and

sending at least the identifier included in the memory contents in response to the second communication.

C. Prior Art

The pending grounds of unpatentability in the instant *inter partes* review are based on the following prior art:

U.S. Patent No. 5,627,544, issued May 6, 1997 (Ex. 1006, “Snodgrass”);

U.S. Patent No. 5,819,234, issued Oct. 6, 1998 (Ex. 1007, “Slavin”); and

European Patent Application Publication No. EP 0762332 A2, published Mar. 12, 1997 (Ex. 1009, “Hurta”).

D. Pending Grounds of Unpatentability

The instant *inter partes* review involves the following grounds of unpatentability:

Reference(s)	Basis	Claims
Snodgrass	35 U.S.C. § 102(b)	19, 20, 23, and 24
Slavin and Snodgrass	35 U.S.C. § 103(a)	1–3, 7–12, 16–20, 23, and 24
Hurta	35 U.S.C. § 102(b)	1–3, 7, 10–12, 16, 19, 20, 23, and 24

II. ANALYSIS

A. Claim Interpretation

The Board interprets claims using the “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 interpretation standard as the claim interpretation standard to be applied in *inter partes* reviews). Under this standard, we interpret claim terms using “the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant’s specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997). We presume that claim terms have their ordinary and customary meaning. *See Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1062 (Fed. Cir. 2016) (“Under a broadest reasonable interpretation, words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification and prosecution history.”); *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007) (“The ordinary and customary meaning is the meaning that the term would have to a person of ordinary skill in the art in question.” (internal quotation marks omitted)). A patentee, however, may rebut this presumption by acting as his or her own lexicographer, providing a definition of the term in the specification with “reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

1. “Security Key”

In the Decision on Institution, we interpreted “security key” in claims 1, 10, 19, and 23 of the ’044 patent to mean a key that is checked and validated to grant or deny access to a memory, and encouraged the parties to address the term further during trial if necessary. Dec. on Inst. 6–7. The parties do not dispute this interpretation in their Patent Owner Response and Reply. See PO Resp. 12; Reply 7–8. We do not perceive any reason or evidence that compels any deviation from this interpretation. Accordingly, we adopt our previous analysis of “security key” for purposes of this Decision.

2. Other Limitations

In its Response, Patent Owner argues that various limitations pertaining to the “security key” should be interpreted as follows:

Claim	Term	Proposed Interpretation
1	“receiving . . . memory contents . . . as a result of validation of the security key”	being provided with protected information based on a key that is checked and validated to grant or deny access to the memory
10	“receive . . . memory contents . . . as a result of validation of the security key”	be provided with protected information based on a key that is checked and validated to grant or deny access to the memory
19	“granting access to the memory contents based on the security key”	providing the capability to read or write protected information based on a key that is checked and validated to grant or deny access to the memory

Claim	Term	Proposed Interpretation
23	“grant access to the memory contents based on the security key”	provide the capability to read or write protected information based on a key that is checked and validated to grant or deny access to the memory

PO Resp. 14–16.⁴ According to Patent Owner, granting access “based on” the security key means that “the tag’s decision to grant or deny access to the tag’s memory is made *only after the processor has actually received the security key*.” *Id.* at 19 (citing Ex. 2032 ¶ 146). Patent Owner argues that

a [person of ordinary skill in the art] would understand that the security key is similar to a key that unlocks a door. Without the key the door is closed; and in the context of the ’044 Patent, without the security key, there is no access to any of the information in the memory which is protected by the security key. Thus, an RFID system in which a reader has the capability to read or write protected information to the chip’s memory prior to the chip’s processor having received, checked and validated the security key, would not meet the limitations of the Challenged Claims of the ’044 Patent.

Id. at 15. Petitioner disagrees with various aspects of Patent Owner’s proposed interpretations, and argues that the phrases instead mean that “access to memory depends, in part, on the security key.” Reply 7–14, 18–19 (emphasis omitted).

⁴ With respect to the individual words of the phrases, Patent Owner argues that “grant access” (misquoted as “provide access”) means “provide the capability to read or write information,” and “memory” means an “area for storing computer instructions and data for either short-term or long-term purposes,” where “data” is “any information, represented in binary, that a computer receives, processes, or outputs.” PO Resp. 12–13. We address the individual words in our discussion of the full phrases herein.

Based on our review of the full record and the parties' arguments, we are persuaded that Patent Owner's proposed interpretations are too narrow, and incorrectly limit the claims in five respects. First, according to Patent Owner, access to the memory includes the ability to read from or write to the memory. PO Resp. 12–16. The claims, however, only recite information being provided from the memory contents of the RFID transponder to the RFID reader, not the RFID reader writing information to the memory. Thus, we do not include in our interpretations the concept of writing information to the memory.

Second, Patent Owner appears to contend that access to the memory must be based *only* on checking and validating the security key (i.e., the system cannot check any other information). *See id.* at 15, 31–32 (arguing that Snodgrass does not teach the “granting access” limitations in claims 19 and 23 because there are “several other parameters in addition to the arbitration number that must be checked”). We agree with Petitioner that the claim language is not limited in that respect. *See* Reply 18–19. Claim 19 specifies that access to the memory contents (which include the identifier) is granted based on the security key. Claim 1 similarly recites receiving the identifier as a result of validation of the security key. Claims 10 and 23 recite similar limitations. Thus, access to the memory contents is contingent on, or “based on,” the security key, which is a key that is checked and validated to grant or deny access to a memory. The claims do not include any language precluding other security checks from being performed as well. Based on Patent Owner's locked door analogy quoted above, the parties discussed at the hearing that a door may have both a key lock and a deadbolt lock, but access to the house is still “based on” the physical key

matching the pins in the key lock. See PO Resp. 15; Tr. 9:8–18, 45:12–46:13. We agree that the “based on” and “as a result of” language in the independent claims should be read the same way.

Third, Patent Owner appears to argue that the claims require *all* data stored in memory to be “protected” by the security key (i.e., nothing in memory may be accessible without checking and validating the security key). See PO Resp. 15, 19–28 (arguing that “the tag’s decision to grant or deny access to the tag’s memory is made only after the processor has actually received the security key,” and Snodgrass does not teach the “granting access” limitations in claims 19 and 23 because the REVISION data field “is accessible to the reader without the reader providing an arbitration number” (emphasis omitted)). Interpreting the limitations cited above in the manner Patent Owner suggests would be inconsistent with the language of the claims. Dependent claim 4, for example, recites sending a third communication to the RFID transponder with a second security key and “receiving further memory contents . . . as a result of validation of the second security key.” See Reply 14; Tr. 13:21–14:4. Similarly, claim 21 recites receiving a third communication with a second security key, “granting access to the memory based on the second security key,” and “sending further memory contents in response to the third communication.” Access to the portion of memory storing the “further memory contents” is granted based on the “second security key,” not based on the “security key” recited in the corresponding independent claims. Thus, the claims contemplate that there are certain portions of memory for which access is granted based on the security key, and certain portions of memory that may be accessed without checking and validating the security key. Patent Owner

agreed with this principle at the hearing. Tr. 52:9–20. Patent Owner’s declarant, Jack Goldberg, agreed as well. Ex. 1049, 56:12–57:4 (agreeing that “there may be some information [in memory] that’s protected by a security key and some information that’s not”). Accordingly, in the context of independent claims 1, 10, 19, and 23, granting access to the “memory contents” means providing the capability to read certain data stored in the memory.

Fourth, Patent Owner contends that the “primary purpose” of the ’044 patent (which allegedly distinguishes the claims from prior art references like Snodgrass) is to “provide security to the contents of a tag’s memory.” PO Resp. 7–8. Regardless of how the “primary purpose” of the challenged independent claims is characterized, their scope is defined by the language of the claims. The claims do not recite any encryption, and the “security” provided by virtue of the “security key” is based on what is recited expressly in the claims—validating the security key (claims 1 and 10), and granting access to the memory contents based on the security key (claims 19 and 23). See Dec. on Inst. 6–7. This reading is supported by Patent Owner’s statements in a previous district court case involving related patents:

THE COURT: What you are saying is that the communication isn’t encrypted, but isn’t the information in the reader and the tag encrypted?

[PATENT OWNER’S COUNSEL]: I don’t believe so.

THE COURT: Okay. So anybody who could figure out what’s going on between the reader and the tag could do this?

[PATENT OWNER’S COUNSEL]: Yes.

THE COURT: So how is it a security key?

[PATENT OWNER’S COUNSEL]: Well, it’s making sure that – that’s right. So it’s a low level of security potentially, if that’s the point. But it is *making sure that I am talking to a reader that got my random number before I send it back. . . .*

Ex. 1031, 108:3–16 (emphasis added);⁵ see Reply 9–10. We do not read any additional “security” requirements into the claims.

Fifth, Patent Owner contends that “[t]he claim language of the ’044 Patent . . . clearly shows that singulation is not part of the inventions.” PO Resp. 8–11. Singulation is “a method utilized in an RFID system that allows an RFID reader to identify a specific tag within a group of tags in its RF field” and avoid collisions when multiple tags are “sending and receiving signals in the same shared frequency band . . . at the same time.” *Id.* at 8 (citing Ex. 2032 ¶ 24); see also Ex. 1014 ¶ 45 (“The process of identifying a single tag is called ‘singulation.’”). Patent Owner argues that the embodiments described in the Specification of the ’044 patent involve a single tag within the field of a reader, claims 1 and 19 “grant access to one and only one RFID transponder,” claim 10 recites “communication with one and only one RFID transponder,” and claim 23 recites “a single RFID transponder.” PO Resp. 9–11. Thus, the claims “assume[.]” that “singulation has already occurred prior to any exchange of protected information and prior to the transmission of any security key.” *Id.* (emphasis omitted). According to Patent Owner, prior art like Snodgrass, which is directed to “singulation” rather than “security,” does not disclose granting access to memory contents “as a result of validation of the security key” or “based on the security key,” as recited in the claims. *Id.* at 10–11.

⁵ When citing Exhibits 1031 and 2022, we refer to the page numbers of the original transcript, rather than the page numbers in the lower-right corner added by the parties.

We do not read into the challenged independent claims any limitation with respect to singulation. Neither the claims nor the Specification mention the concept. The claims recite particular sets of steps or components that are configured to perform certain steps; if those limitations are present in the prior art, the prior art may render the claims anticipated or obvious, regardless of the ultimate purpose behind why the components are so configured (e.g., for singulation or any other function).⁶ We also disagree with Patent Owner that the claims are limited to “one and only one” RFID transponder. *See id.* at 9–10. Because the claims use the open-ended term “comprising,” the fact that they recite a single “RFID transponder” does not preclude the presence of additional RFID transponders. *See Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1344–45 (Fed. Cir. 2003) (“comprising” means that “the named elements are essential, but other elements may be added and still form a construct within the scope of the claim” (citation and internal quotation marks omitted)). Likewise, exemplary embodiments are described in the Specification with respect to one RF device communicating with one RF reader, but Patent Owner does not point to any language indicating that the invention is limited to communication with a single RF device. *See, e.g.*, Ex. 1004, col. 2, ll. 22–57 (“This embodiment comprises an RF device 110 . . . and an RF reader/writer 125.”), col. 10, ll. 24–33. Thus, we do not interpret the claims

⁶ Patent Owner cites the testimony of Petitioner’s declarant, Roger Stewart, as allegedly inconsistent with this reading, but the cited testimony pertains to the related ’568 patent, not the ’044 patent. *See* PO Resp. 10 n.2; Ex. 2022, 204:19–205:8. Regardless, Mr. Stewart testified that although the ’568 patent “wasn’t an anticollision patent, . . . the claims are broad enough to cover anticollision situations.” Ex. 2022, 204:19–205:8.

to exclude any use of the recited components for singulation, or any requirement that singulation already have occurred; the claims mean just what they say.

Accordingly, applying the broadest reasonable interpretation of the claims in light of the Specification, we interpret the disputed limitations as follows:

Claim	Term	Interpretation
1	“receiving at least the identifier included in the memory contents . . . as a result of validation of the security key”	being provided with the identifier included in the memory contents based on a key that is checked and validated to grant or deny access to the memory contents
10	“receive at least the identifier included in the memory contents . . . as a result of validation of the security key”	be provided with the identifier included in the memory contents based on a key that is checked and validated to grant or deny access to the memory contents
19	“granting access to the memory contents based on the security key”	providing the capability to read certain contents of the memory (i.e., at least the identifier) based on checking and validating the security key
23	“grant access to the memory contents based on the security key”	provide the capability to read certain contents of the memory (i.e., at least the identifier) based on checking and validating the security key

B. Anticipation Ground Based on Snodgrass

Petitioner argues that claims 19, 20, 23, and 24 are anticipated by Snodgrass under 35 U.S.C. § 102(b), relying on the supporting testimony of

Mr. Stewart. Pet. 10–14 (citing Ex. 1001). We have reviewed the Petition, Patent Owner Response, and Reply, as well as the evidence discussed in each of those papers, and are persuaded, by a preponderance of the evidence, that claims 19, 20, 23, and 24 are anticipated by Snodgrass.

1. Snodgrass

Snodgrass describes a messaging protocol for establishing RF communication between an interrogator and a particular responder from among a group of responders, such as in a baggage handling system in an airport terminal. Ex. 1006, col. 1, ll. 29–35. Figure 1 of Snodgrass is reproduced below.

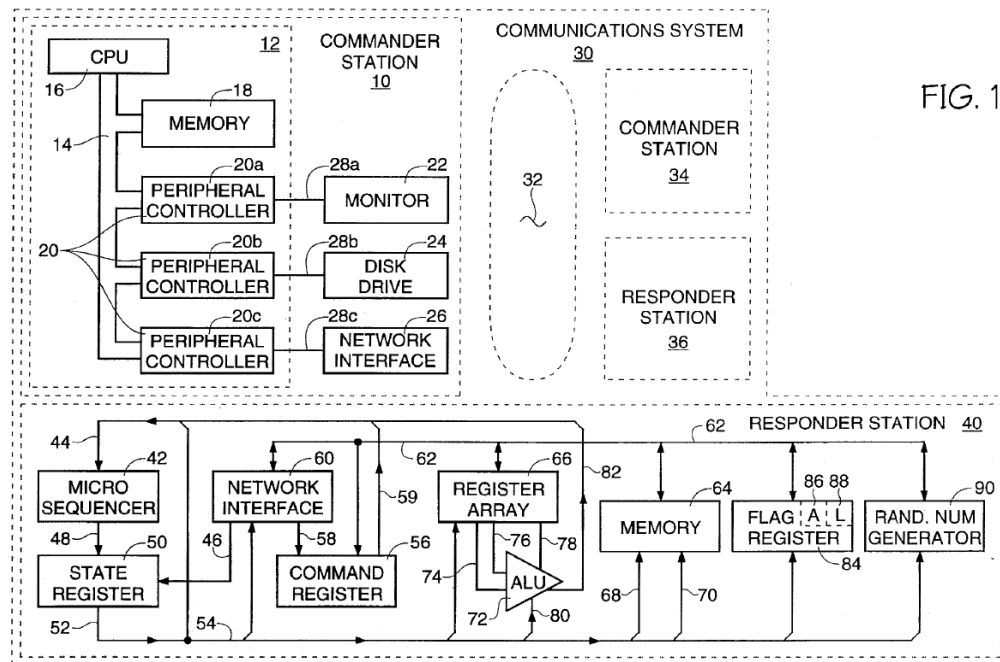


Figure 1 depicts commander station 10, which communicates wirelessly with a group of responder stations, including responder station 40. *Id.* at col. 5, ll. 41–53. Responder station 40 includes register array 66, memory 64, flag register 84 (storing addressed-bit 86 and locked-bit 88), and random

number generator 90. *Id.* at col. 6, ll. 57–61, col. 7, ll. 40–47. “Memory 64 is used to store values for responder station identification and data related to the communication system application,” such as, in the case of a baggage handling system, “data describing [the] destination for the item to which the tag is attached.” *Id.* at col. 7, ll. 12–19. Register array 66 stores additional data, such as a random number (designated as the ARBITRATION NUMBER) generated by random number generator 90. *Id.* at col. 7, ll. 21–30, 50–55. Addressed-bit 86 is set to “indicate whether responder station 40 has been addressed in a received command message,” and locked-bit 88 is set to “indicate whether responder station 40 should ignore messages from a commander station because responder station 40 has already announced its identification to a commander station.” *Id.* at col. 7, ll. 40–47.

Snodgrass discloses a communication system protocol comprising various actions taken by the commander station, shown in Figure 10, and actions taken by the responder station, shown in Figure 11 reproduced below.

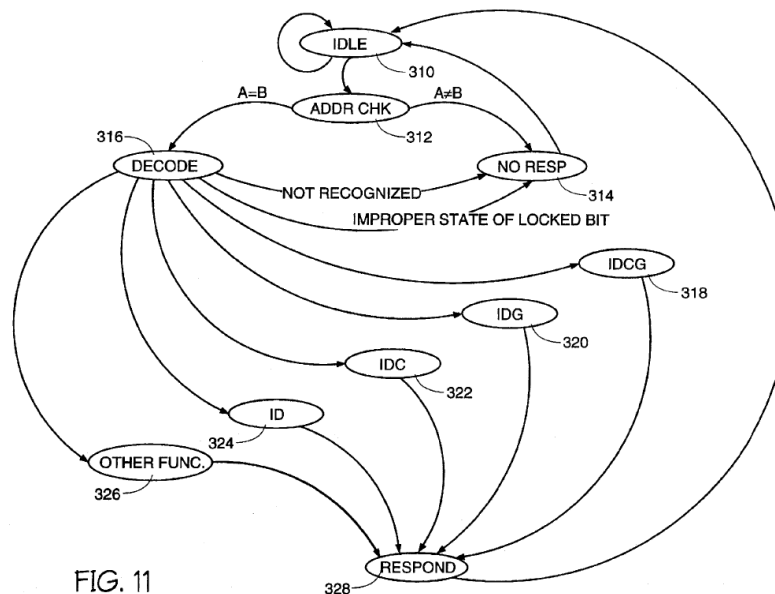


FIG. 11

Figure 11 is a state diagram of the protocol followed by the responder station. *Id.* at col. 5, ll. 26–27, col. 12, ll. 30–38.

The protocol begins by the commander station first broadcasting an “identify, clear, and generate” (IDCG) command to a group of responder stations. *Id.* at col. 13, ll. 40–45. The IDCG command causes each responder station to “generate a random number and retain it as its ARBITRATION NUMBER, and broadcast a response.” *Id.* at col. 13, ll. 45–48, col. 15, ll. 47–52, Fig. 11 (state 318). The IDR response from each responder station includes, *inter alia*, REVISION, LOCAL ID, and ARBITRATION NUMBER data fields. *Id.* at col. 12, ll. 5–21, col. 15, ll. 47–52, Figs. 8, 9 (format 192). REVISION is “a one-byte value set by a communication system developer at the time of manufacture or commissioning of a responder station,” and “represents the responder station configuration and connotes its capability.” *Id.* at col. 12, ll. 17–21. LOCAL ID is a “unique identification number assigned” to the commander station. *Id.* at col. 11, ll. 11–14.

The commander station waits to receive responses and then determines whether a collision between multiple responses occurred. *Id.* at col. 13, ll. 51–57. If only one response was received, the commander station “determines and validates the responding responder station’s ARBITRATION NUMBER.” *Id.* at col. 14, ll. 7–13. The commander station then selects a command to communicate with the particular responder station, such as a read (RD) command, and broadcasts it to the responder stations. *Id.* at col. 14, 13–23. The RD command includes, *inter alia*, the ARBITRATION NUMBER identifying the responder station as the one that “should act on [the] command and should reply,” and causes the

responder station to set its locked-bit 88. *Id.* at col. 11, ll. 18–22, col. 14, ll. 13–23, Figs. 5, 6 (format 144).

In response to receiving the RD command, the responder station determines whether it has been addressed by determining whether the ARBITRATION NUMBER stored in its register array is “bit-wise identical to [the] ARBITRATION NUMBER as received in the command.” *Id.* at col. 15, ll. 26–32, Fig. 11 (address check state 312). If so, the responder station responds with a message that includes, *inter alia*, its stored ARBITRATION NUMBER, TAG, and DATA. *Id.* at col. 12, ll. 5–29, Figs. 8, 9 (response format 194). TAG is a long value identifying the responder station “throughout the life of the communication system application,” whereas the ARBITRATION NUMBER is a short value identifying the responder station only for the period of time when it is in communication with a particular commander station. *Id.* at col. 11, ll. 22–33. DATA includes data stored in various memory devices in the responder station, and may include “some or all of the contents of any or all devices including memory 64, register array 66, flag register 84, or random number generator 90.” *Id.* at col. 7, ll. 13–20, col. 12, ll. 26–29. Once the commander station receives a proper response to the RD command, “two party uninterrupted communication between commander station 10 and one responder station 60 has been established.” *Id.* at col. 14, ll. 23–30.

2. Analysis

Petitioner has presented evidence showing that Snodgrass discloses every limitation of claims 19, 20, 23, and 24. Pet. 10–14. With respect to claim 19, Petitioner argues that Snodgrass discloses an “RFID transponder”

(i.e., responder station) receiving a “first communication” (i.e., IDCG command) and a “second communication” (i.e., RD command) that includes a “security key” (i.e., arbitration number), granting access to memory contents based on the arbitration number, and sending an “identifier” (i.e., TAG or DATA) included in the memory contents. *Id.* at 10–14. As to the limitation of “granting access to the memory contents based on the security key,” Petitioner argues that the responder station in Snodgrass “determines whether to respond by comparing the arbitration number in the [RD] command to the arbitration number in its register array,” and when there is a match, “the command station receives from the responder station TAG and DATA.” *Id.* at 13–14. Claim 23 recites limitations similar to those of claim 19, and Petitioner argues that Snodgrass teaches an “RFID transponder” (i.e., responder station) with a “memory” (i.e., memory where TAG and DATA are stored, such as memory 64, register array 66, or flag register 84), “radio front end” (i.e., transmitter 164 and receiver 170), “antenna” (i.e., antenna 168), and “processor” (i.e., arithmetic-logic unit 72 and microsequencer 42). *Id.* at 10–14. Claims 20 and 24 recite sending a “response to the first communication” that includes the security key, and Petitioner cites Snodgrass’s IDR response in format 192, which includes the ARBITRATION NUMBER. *Id.* at 14. Petitioner’s analysis, supported by the testimony of Mr. Stewart, is persuasive. *See id.* at 10–14; Ex. 1001 ¶¶ 84–151.

Patent Owner argues that Snodgrass does not disclose a security key that grants access to the contents of a memory, as recited in independent claims 19 and 23, for four reasons. PO Resp. 18–32. First, Patent Owner contends that Snodgrass’s arbitration number is not a “security key” because

it is “used to determine if a responder station has been addressed and not to grant or deny access to memory.” *Id.* at 18. We are not persuaded. In Snodgrass’s communication protocol, the responder station receives an RD command with an arbitration number, compares the received arbitration number with the one stored in memory, and provides TAG and DATA only when there is a match. *See* Ex. 1006, col. 15, ll. 26–34; Pet. 10, 12–14; Ex. 1001 ¶¶ 129–43. Importantly, the responder station does *not* provide TAG and DATA if there is not a match, as Mr. Goldberg acknowledged. *See* Ex. 1006, col. 15, ll. 31–34; Ex. 1049, 87:21–88:22. In other words, access to TAG and DATA is contingent on a matching arbitration number being sent by the commander station in the RD command. *See* Tr. 44:16–24, 46:14–47:5 (Patent Owner acknowledging that “there’s no question the arbitration number is checked” in Snodgrass, and that a matching arbitration number is a “prerequisite” to sending the response to the RD command). The fact that the arbitration number *also* serves the purpose of identifying the responder station does not negate the fact that it is used by the responder station to perform a comparison and only provide data from memory in the case of a match. Thus, we agree with Petitioner that the arbitration number in Snodgrass is a key that is checked and validated to grant or deny access to a memory. *See* Pet. 10, 12–14.

Second, Patent Owner argues that “information stored in a tag’s memory [in Snodgrass] can be accessed without the arbitration number.” PO Resp. 19–27. Specifically, in response to a broadcasted IDCG command from the commander station, the responder station sends an IDR response, which includes the REVISION data field. *Id.* at 19–20. According to Patent Owner and Mr. Goldberg, REVISION identifies the capabilities of the

responder station and, therefore, would need to be protected by the security key, but it can be accessed by the commander station prior to sending the arbitration number and having it checked and validated by the responder station. *Id.* at 19–27 (citing Ex. 2032 ¶¶ 122, 124, 133–38, 146, 147, 152–54). Therefore, Snodgrass does not grant access to the memory “as a result of validation of,” or “based on,” a security key according to Patent Owner.

As an initial matter, we disagree with Patent Owner’s factual assertions regarding the REVISION data field. Patent Owner asserts that a person of ordinary skill in the art would understand that REVISION and TAG are part of DATA. *Id.* at 21–22 (citing Ex. 2032 ¶¶ 137–38). Snodgrass, however, clearly describes them as three distinct data fields. *See, e.g.,* Ex. 1006, col. 11, ll. 25–35, col. 12, ll. 17–21, 26–29, Fig. 9 (formats 192 and 194). Thus, we are not persuaded that REVISION is part of the memory storing TAG and DATA, which is what Petitioner identifies as the alleged “memory contents” recited in the claims. *See* Pet. 11–14; Reply 16.

Even if REVISION were part of the memory storing TAG or DATA, though, Patent Owner’s argument is not persuasive. As explained above, we do not interpret the claims to require that all data stored in memory be accessible via the security key, as such a reading would be inconsistent with the language of the claims. *See supra* Section II.A.2. Rather, “granting access to the memory contents based on the security key” in claim 19 means providing the capability to read certain contents of the memory (i.e., at least the identifier) based on checking and validating the security key. Claim 23 recites a similar limitation. Snodgrass provides the capability to read the

portions of memory in the responder station that store TAG and DATA⁷ based on checking and validating the arbitration number. *See* Pet. 10, 12–14. The fact that other portions of memory, such as the portion storing REVISION, may be accessed prior to checking and validating the arbitration number is immaterial, given the broad language of the claim.

Third, similar to its second argument, Patent Owner contends that “information stored in a tag’s memory in Snodgrass is not protected” because REVISION constitutes “identification information” for the responder station and would be protected by security, but it is accessible to the commander station without providing the arbitration number. PO Resp. 27–28. Patent Owner’s arguments regarding the REVISION data field are not persuasive, for the reasons explained above.

Fourth, Patent Owner argues that “Snodgrass’s arbitration number does not grant or deny access to a tag’s memory.” *Id.* at 29–32. According to Patent Owner, the arbitration number “is not sufficient to ensure that access is granted for RD and WD commands” because “several other parameters in addition to the arbitration number . . . must be checked” as well. *Id.* at 31. Specifically, Snodgrass also checks “(1) whether or not the tag has been singulated, (2) whether or not the tag has already fully provided its identification information, and (3) whether or not the received command is recognized.” *Id.* As explained above, we do not interpret the claims to require access to the memory contents to be granted based only on checking

⁷ Specifically, TAG and DATA could be stored in any of memory 64, register array 66, flag register 84, or random number generator 90. *See* Ex. 1006, col. 7, ll. 13–20, col. 11, ll. 24–35, col. 12, ll. 26–29. The ARBITRATION NUMBER would be stored in a different portion of memory in register array 66. *Id.* at col. 7, ll. 21–30, 50–55.

and validating the security key; the system may check other information as well. *See supra* Section II.A.2; Reply 18–19. Accordingly, the fact that other security checks also are performed is immaterial, given that Snodgrass discloses receiving an arbitration number, comparing it to the arbitration number stored in memory, and providing information stored in memory in response when the arbitration numbers match. *See* Pet. 10, 12–14.

We are persuaded that Snodgrass discloses every limitation of independent claims 19 and 23, for the reasons provided by Petitioner. *See id.* at 10–14. With respect to dependent claims 20 and 24, Patent Owner relies on its arguments with respect to independent claims 19 and 23, and does not argue separately the limitations of the dependent claims. PO Resp. 32; *see* Pet. 14. We have reviewed the Petition, Patent Owner Response, and Reply, as well as the evidence discussed in each of those papers, and are persuaded, by a preponderance of the evidence, that claims 19, 20, 23, and 24 are anticipated by Snodgrass under 35 U.S.C. § 102(b).

C. Obviousness Ground Based on Slavin and Snodgrass

Petitioner argues that claims 1–3, 7–12, 16–20, 23, and 24 are unpatentable over Slavin and Snodgrass under 35 U.S.C. § 103(a), relying on the supporting testimony of Mr. Stewart. Pet. 16–31 (citing Ex. 1001). We have reviewed the Petition, Patent Owner Response, and Reply, as well as the evidence discussed in each of those papers, and are persuaded, by a preponderance of the evidence, that claims 1–3, 7–12, and 16–18 are unpatentable over Slavin and Snodgrass.

1. Slavin

Slavin describes an “electronic toll collection system” where a toll collection plaza receives information from RF transponders in vehicles passing through the plaza. Ex. 1007, col. 1, ll. 4–8, col. 5, ll. 40–49. Figure 1 of Slavin is reproduced below.

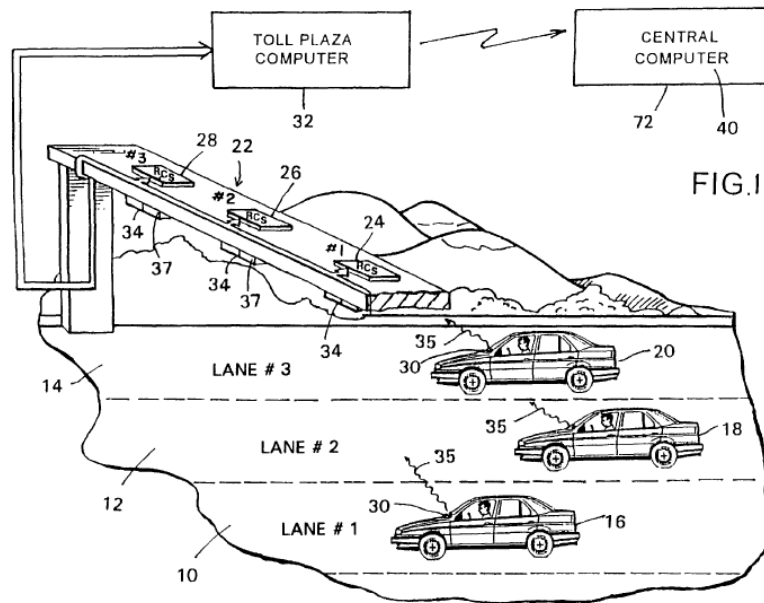


Figure 1 depicts an automatic toll collection plaza with Roadside Collection Stations (RCS's) 24, 26, and 28 that communicate wirelessly with RF transponders 30 in vehicles 16, 18, and 20. *Id.* at col. 5, ll. 40–49. The RCS's interrogate the transponders, and “each of the transponders 30 broadcasts a unique tag number associated therewith which is received and correlated by the RCS's with a toll account number of the vehicle.” *Id.* at col. 1, ll. 33–40, col. 5, ll. 49–52. Toll plaza computer 32 uses the tag number to identify the transponder and corresponding account, causes the toll amount to be deducted from the account, and alerts the driver accordingly (e.g., by flashing green light 34). *Id.* at col. 1, ll. 33–40, col. 9, ll. 49–63.

2. Level of Ordinary Skill in the Art

Section 103(a) forbids issuance of a patent when “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) (quoting 35 U.S.C. § 103(a)). Petitioner’s declarant, Mr. Stewart, testifies that he believes a person of ordinary skill in the art would have had “a graduate degree in engineering or physics” and “at least 2–4 years of relevant experience in designing and developing RFID tags and readers, including understanding RFID systems and communication protocols.” Ex. 1001 ¶ 61. Patent Owner argues that a person of ordinary skill in the art would have had “a university degree in electrical engineering or a related field and at least two years of industrial or academic experience in radio frequency data communication and/or RFID systems.” PO Resp. 16–17. According to Patent Owner, a person of ordinary skill in the art would have had “experience in RFID communication systems and protocols,” but need not have “actually developed or designed components” for such systems. *Id.* Petitioner disagrees, arguing that design and development experience is necessary. Reply 2–4.

Based on our review of the ’044 patent, the types of problems and solutions described in the ’044 patent and cited prior art, and the testimony of the parties’ declarants, we conclude that a person of ordinary skill in the art would have had a degree in electrical engineering or a similar field and at least two years of industrial or academic experience with radio frequency data communication and/or RFID systems, including an understanding of

RFID systems and communication protocols. We do not include a requirement of actually designing and developing RFID tags and readers. The challenged claims are directed mainly to what signals are exchanged, and under what circumstances, between an “RFID transponder” and an “RFID reader,” not the mechanics of how the communications work. The Specification of the ’044 patent also describes the physical construction of such devices at a fairly high level of granularity, as does the cited prior art. *See, e.g.*, Ex. 1004, col. 2, ll. 22–63; Ex. 1007, col. 1, l. 4–col. 2, l. 48; Ex. 1006, col. 5, l. 41–col. 10, l. 37. We are satisfied that an individual having general experience with radio frequency data communication and/or RFID systems, as well as an understanding of RFID systems and communication protocols, would have been able to understand the ’044 patent and similar art, without having actually designed and developed RFID tags and readers.

Applying the level of ordinary skill in the art set forth above for purposes of this Decision, we conclude that both of the parties’ declarants, Mr. Stewart and Mr. Goldberg, are qualified to offer expert testimony in this proceeding, and we do not give Mr. Goldberg’s testimony less weight merely based on his qualifications, as Petitioner advocates. *See* Ex. 1001 ¶¶ 8–16; Ex. 1002 (describing the qualifications of Mr. Stewart, who has bachelor’s and master’s degrees in electrical engineering and experience with RF technology); Ex. 2032 ¶¶ 3–16, pp. 127–41 (describing the qualifications of Mr. Goldberg, who has bachelor’s and master’s degrees in electrical engineering and experience with RF technology); Reply 5–7.

3. Claim 1

a. Slavin and Snodgrass Teach Every Limitation of Claim 1

Petitioner has presented evidence showing that Slavin and Snodgrass teach every limitation of claim 1. Pet. 16–21. Specifically, Petitioner argues that Snodgrass teaches sending a “first communication” (i.e., IDCG command) to an “RFID transponder” (i.e., responder station), sending a “second communication” (i.e., RD command) that includes a “security key” (i.e., arbitration number) for validation, and receiving an “identifier” (i.e., TAG or DATA) stored in “memory contents” of the responder station as a result of validation of the arbitration number (i.e., comparing the received arbitration number to the one stored in memory). *Id.* at 16–20. Petitioner relies on Slavin as teaching the step of “comparing the identifier to an identifier stored in a database to determine if the two identifiers are related,” citing Slavin’s disclosure of comparison operations performed by the toll plaza computer. *Id.* at 20–21. According to Petitioner, a person of ordinary skill in the art would have had reason to combine Slavin’s teaching of a toll collection system that interrogates transponders and compares returned identifiers with Snodgrass’s teaching of a particular communication protocol that returns TAG and DATA to the commander station. *Id.* at 16–21. Petitioner’s analysis, supported by the testimony of Mr. Stewart, is persuasive. *See id.*; Ex. 1001 ¶¶ 176–234.

Patent Owner argues that Snodgrass does not teach “receiving at least the identifier included in the memory contents . . . as a result of validation of the security key,” as recited in claim 1, for the same reasons as it argues Snodgrass does not teach the similarly recited limitation in claims 19 and 23. PO Resp. 40–42. We are not persuaded, for the reasons set forth above. *See*

supra Section II.B.2. We have reviewed the Petition, Patent Owner Response, and Reply, as well as the evidence discussed in each of those papers, and are persuaded that Slavin and Snodgrass teach every limitation of claim 1.

b. A Person of Ordinary Skill in the Art Would Have Had Reason to Combine the Teachings of Slavin and Snodgrass

Having found that Slavin and Snodgrass teach all of the limitations of claim 1, we turn to whether a person of ordinary skill in the art would have had reason to combine the teachings of the references to achieve the claimed system. We are guided by the Supreme Court’s decision in *KSR*, 550 U.S. 398. “[W]hen a patent ‘simply arranges old elements with each performing the same function it had been known to perform’ and yields no more than one would expect from such an arrangement, the combination is obvious.” *Id.* at 417 (citation omitted). A determination of obviousness, though, requires identifying “some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* at 417–18 (citation and internal quotation marks omitted).

In its Petition, Petitioner explains in detail why it would have been obvious to a person of ordinary skill in the art to combine the teachings of Slavin and Snodgrass to achieve the method of claim 1, relying on the testimony of Mr. Stewart in support. See Pet. 16–21. Specifically, Petitioner asserts that it would have been obvious to “combine the toll collection system of Slavin with the protocol of Snodgrass in order to provide a tolling system with a protocol that enables use of simpler, and consequently cheaper, tags.” *Id.* at 17 (citing Ex. 1001 ¶ 195). As Petitioner

points out, Slavin discloses an electronic toll collection system that interrogates transponders on vehicles as they pass through, receiving a vehicle's unique tag number in response, but Slavin does not disclose explicitly what protocol it uses for communication between the system and the transponders. *Id.* at 16–17. Slavin also discloses various problems with prior art RFID systems, including that transponders were “more complex and costly,” and states that a desired object of its disclosed system is to “enable use of transponders which are simpler in construction and comparatively inexpensive.” Ex. 1007, col. 2, ll. 39–44, 61–63. Snodgrass similarly acknowledges a need for communication devices and protocols of “minimal complexity in circuitry, firmware, and software.” Ex. 1006, col. 1, ll. 40–46, col. 3, ll. 44–47.

Petitioner argues that a person of ordinary skill in the art, therefore, would have been motivated to “reduce the complexity and expense of transponders used in vehicles in tolling systems,” and Snodgrass discloses one type of communication protocol that would do so. Pet. 17–18 (citing Ex. 1001 ¶¶ 193–95, 197). Snodgrass discloses, for example, that its communication protocol “permits responder stations to be functionally less complex than commander stations,” and states that its disclosed protocol is appropriate for “applications where inventory, personnel, animals, packages, samples, *mobile* stations, and *objects* must be identified and tracked” as they move. Ex. 1006, col. 1, ll. 40–46, col. 3, ll. 44–47 (emphasis added). Petitioner's analysis, supported by the testimony of Mr. Stewart, is persuasive.

Patent Owner contends that it would not have been obvious to one of ordinary skill in the art to combine the teachings of Slavin and Snodgrass

because (1) Petitioner's analysis is conclusory and unsupported; (2) the references address different problems; (3) Snodgrass's transponders actually are more, not less, complex than those of Slavin; and (4) a person of ordinary skill in the art would not have had reason to use Snodgrass's TAG or DATA fields to store Slavin's identifier. PO Resp. 34–39.

First, we do not agree with Patent Owner that Petitioner's analysis of why a person of ordinary skill in the art would have combined the teachings of Slavin and Snodgrass is conclusory and unsupported. *See id.* at 34–35. Rather, as explained above, Petitioner supports its contentions with persuasive testimony from Mr. Stewart and specific citations to the references where they both describe a desire for less complex RFID systems for tracking moving objects. *See* Pet. 16–18; Ex. 1001 ¶¶ 191–98; *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1125 (Fed. Cir. 2000) (evidence of a motivation to combine prior art references “may flow from the prior art references themselves”).

Second, Patent Owner argues that a person of ordinary skill in the art would not have combined the teachings of the references because they “address distinctly different problems.” PO Resp. 36–37 (citing Ex. 2032 ¶¶ 103, 107, 108, 114–17). According to Patent Owner, Slavin is directed to “an automated toll collection system with a simpler and less time-consuming purchasing process that can function with less complex, pre-paid, and ready-to-use tags that the consumer can purchase at a retail outlet,” whereas Snodgrass is directed to a communication protocol for uninterrupted RFID communications between a reader and transponder, and does not pertain to vehicle tracking in particular. *Id.* Patent Owner's argument is not persuasive. Prior art references must be considered as a whole for all that

they teach, regardless of the specific problems to which they are directed. *See KSR*, 550 U.S. at 420–21 (stating that “[t]he idea that a designer hoping to [solve one problem] would ignore [a reference] because [the reference] was designed to solve [a different] problem makes little sense,” as a “person of ordinary skill is also a person of ordinary creativity, not an automaton”); *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1166 (Fed. Cir. 2006) (explaining that in an obviousness analysis, “the prior art must be considered as a whole for what it teaches”); *EWP Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907 (Fed. Cir. 1985) (“A reference must be considered for everything it teaches by way of technology and is not limited to the particular invention it is describing and attempting to protect. On the issue of obviousness, the combined teachings of the prior art as a whole must be considered.” (emphasis omitted)).

Moreover, we do not view the references as so different that an ordinarily skilled artisan would not have thought to combine them. Both references pertain to RFID systems for tracking moving objects, and both evince a desire for less complexity in such systems. *See* Ex. 1007, col. 2, ll. 39–44; Ex. 1006, col. 1, ll. 40–46, col. 3, ll. 44–47; *KSR*, 550 U.S. at 418 (“Often, it will be necessary for a court to look to interrelated teachings of multiple patents . . . to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.”). The fact that they go about reducing complexity in different ways—Slavin via a pre-made transponder purchase process and Snodgrass via a simpler communication protocol—does not indicate that a person of ordinary skill in the art would not have considered using Snodgrass’s communication

protocol in Slavin's toll collection system to achieve simpler and cheaper transponders, as Petitioner contends.

Third, Patent Owner argues that the system disclosed in Slavin actually "uses tags that are far less complex tha[n] those disclosed in Snodgrass," so a person of ordinary skill in the art would not have had reason to use Snodgrass's communication protocol in Slavin's system to achieve simpler and cheaper transponders, as Petitioner contends. PO Resp. 37–38. We are not persuaded. As discussed at the hearing, it is difficult to directly compare the two references and determine which is more complex because Slavin does not disclose explicitly what communication protocol its transponders use. See Tr. 60:24–63:15; Ex. 1007, col. 1, ll. 22–40 (describing the E-ZPass system as an exemplary toll collection system), col. 5, ll. 40–52. Nevertheless, there is support for Petitioner's and Mr. Stewart's position that using the communication protocol of Snodgrass in Slavin's toll collection system would allow for simpler and cheaper transponders. See Pet. 16–18; Ex. 1001 ¶¶ 195–98. Namely, Snodgrass discloses that its transponders are designed for "minimal logic and circuitry," "small size," "low power consumption," and "low manufacturing costs." Ex. 1006, Abstract, col. 6, ll. 13–20. On the other hand, Patent Owner's only support for its position that Slavin's transponders are less complex than those of Snodgrass is Mr. Goldberg, whose testimony mirrors Patent Owner's argument in its Response. See PO Resp. 37–38; Ex. 2032 ¶ 191. Mr. Goldberg does not cite any support in the record for his opinion, and acknowledged during cross-examination that he is "not familiar with the specifics of the E-ZPass [communication] protocol." See Ex. 2032 ¶ 191; Ex. 1049, 21:22–22:1; *In re Am. Academy of Sci. Tech. Ctr.*, 367 F.3d 1359,

1368 (Fed. Cir. 2004) (“the Board is entitled to weigh the declarations and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations”). We are persuaded that, regardless of any differences in overall complexity between Slavin’s transponders and those of Snodgrass, the disclosure of Snodgrass itself indicates advantages of its transponders that would have spurred an ordinarily skilled artisan to consider using its communication protocol in a system like the one described in Slavin.

Patent Owner similarly argues that, contrary to Petitioner’s assertions, the proposed combination would only result in a system that could “singulate” transponders according to Snodgrass’s communication protocol, where Slavin does not discuss or need to perform any singulation. PO Resp. 37–38 (citing Ex. 2032 ¶¶ 188–91). Snodgrass’s communication protocol pertains to more than just singulation, however. Even if transmitting the IDCG command and receiving a response can be considered singulation, the additional processing of sending the RD command and receiving a response (i.e., what Petitioner relies on for the “second communication” and information provided “in response to the second communication” in claim 1) is not singulation. It is not part of the process of identifying a particular tag from among a group of tags, but rather reading data from a single tag that already has been identified by its ARBITRATION NUMBER. See Tr. 54:9–56:4. In addition, Patent Owner does not explain in any detail why Slavin would have no need for singulation. Indeed, it appears that Slavin would need to perform some form of singulation because multiple vehicles could potentially be within range of a particular RCS at the same time. See Ex. 1007, Fig. 1.

Fourth, Patent Owner disputes that a person of ordinary skill in the art would have had reason to store “vehicle identification information,” as taught by Slavin, in Snodgrass’s TAG or DATA fields. PO Resp. 38–39. Patent Owner points out that TAG is assigned at the time the responder station is manufactured and identifies the device itself, rather than the object to which the device is attached. *Id.* at 38 (citing Ex. 1006, col. 11, ll. 25–28). According to Patent Owner, if TAG instead were used to store “vehicle identification information,” the responder station “would be associated with the vehicle and could not easily be transferred from vehicle to vehicle.” *Id.* (citing Ex. 2032 ¶¶ 192–95). This argument is not persuasive, as claim 1 of the ’044 patent recites an “identifier” included in the memory contents, not “vehicle identification information.”⁸ Regardless, we do not see any reason why protected data, like TAG, could not identify both the tag itself and the vehicle to which it is attached. Petitioner provides an example of a license plate number that “is registered with the DMV” for the vehicle, despite the fact that it only identifies the plate upon which it is placed, which we find persuasive in that regard. Reply 22–23. Further, to the extent incorporating Snodgrass’s communication protocol in the system of Slavin would require minor modifications to the functionality of either, we are persuaded that such modifications could have been done, as it is often necessary and within the level of ordinary skill in the art to modify the teachings of two references in order to combine them. *See In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1382 (Fed. Cir. 2007) (the obviousness analysis must account for “modifications that one skilled in the art would make to a device borrowed

⁸ Dependent claim 8, which we address below, recites that the identifier is a “vehicle identifier.”

from the prior art”); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. . . . Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.”).

Patent Owner likewise contends that a person of ordinary skill in the art would not have stored Slavin’s “vehicle identification information” in Snodgrass’s DATA field. PO Resp. 38–39 (citing Ex. 2032 ¶ 194). Again, we are not persuaded. Patent Owner’s position is that “vehicle identification information” in Slavin “is stored in the Toll Plaza Computer and not in the tag itself.” *Id.* (citing Ex. 1007, col. 5, ll. 53–66). Slavin’s “unique tag number,” however, is stored in the transponder and broadcast to the RCS. Ex. 1007, col. 1, ll. 33–40, col. 5, ll. 49–60; *see* Pet. 16–17, 20–21. Even if the “identifier” of claim 1 were required to be “vehicle identification information,” the unique tag number constitutes vehicle identification information because once it is received from the transponder, it is “correlated by the RSC’s with a toll account number of the *vehicle*.” Ex. 1007, col. 5, ll. 49–52 (emphasis added); *see* Pet. 16–17, 20–21; Reply 22–23. We agree with Petitioner that a person of ordinary skill in the art, considering both references, would have had reason to combine Slavin’s teaching of an identifier with Snodgrass’s teaching of the use of the DATA field. Patent Owner also argues that “vehicle identification information” would not be secure if it were stored in Snodgrass’s DATA field. PO Resp. 39. As explained above, though, Snodgrass provides security by comparing the received arbitration number to the one stored in memory, and only providing data from the DATA field if there is a match. *See supra* Section

II.B.2. Mr. Goldberg also acknowledged that Snodgrass provides “some level of security.” Ex. 1049, 94:6–12.

Accordingly, we are persuaded that Slavin and Snodgrass teach all of the limitations of claim 1, and that a person of ordinary skill in the art would have had reason to combine their teachings to achieve the recited method.

c. Secondary Considerations of Nonobviousness

As part of our obviousness analysis, we consider the evidence and arguments submitted by Patent Owner regarding secondary considerations of nonobviousness. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Patent Owner argues that commercial success, through licensing of the ’044 patent to others, demonstrates that the challenged claims would not have been obvious to a person of ordinary skill in the art.⁹ PO Resp. 42–43. Patent Owner contends that it “recently entered into two agreements which relate[] to its patents, including the ’044 and related Patents, under which it is to be paid—and has been paid—substantial fees.” *Id.* at 43. Patent Owner cites two agreements where it granted a non-exclusive license to “the patents, including the ’044 Patent,” in exchange for fees from the licensees. *Id.* (citing Ex. 2047, Ex. 2049,¹⁰ Ex. 2032 ¶¶ 62–70).

Evidence of commercial success “is only significant if there is a nexus between the claimed invention and the commercial success.” *Ormco Corp.*

⁹ The parties refer to the challenged claims collectively in their arguments regarding secondary considerations, and we do the same. *See* PO Resp. 42–43; Reply 24–25.

¹⁰ The agreement filed as Exhibit 2049 has been filed under seal. *See* Paper 29. We need not refer to any specific provisions of the agreement, however, to assess Patent Owner’s secondary considerations arguments.

v. Align Tech., Inc., 463 F.3d 1299, 1311–12 (Fed. Cir. 2006). In the case of licensing activity, “the relevant inquiry is whether there is a nexus between the patent and the licensing activity itself, such that the factfinder can infer that the licensing ‘arose out of recognition and acceptance of the subject matter claimed’ in the patent.” *South Alabama Med. Sci. Found. v. Gnosis S.P.A.*, 808 F.3d 823, 827 (Fed. Cir. 2015) (citation omitted); *see also In re Antor Media Corp.*, 689 F.3d 1282, 1293–94 (Fed. Cir. 2012) (finding license evidence deficient where there was “no evidence showing that the licensing program was successful either because of the merits of the claimed invention or because they were entered into as business decisions to avoid litigation, because of prior business relationships, or for other economic reasons”).

Importantly, Patent Owner acknowledges that the license agreements pertained to multiple patents—not just the ’044 patent—but does not explain why the agreements arose out of recognition and acceptance of the merits of the ’044 patent claims in particular. *See* PO Resp. 42–43; Ex. 2047 § 1.7 (defining “Neology Patent Rights” as “all inventions disclosed in patents and patent applications . . . or improvements thereto, owned in whole or in part by, controlled by, or solely or exclusively licensed to [Patent Owner]”); Ex. 2032 ¶¶ 65–66, 68 (describing the agreements); Case IPR2015-00818, Paper 21, 40 (Patent Owner arguing that both agreements also licensed the ’568 patent). In a case involving similar circumstances, the Federal Circuit gave evidence of licensing little weight because it was “difficult to determine the extent to which the licensing agreement was a result of the novel features in the [patent at issue], as opposed to the other patents involved.” *Merck & Cie v. Gnosis S.P.A.*, 808 F.3d 829, 838 (Fed. Cir.

2015). That is the case here as well. We also note that although Patent Owner asserts that the license fees paid in accordance with the agreements were “substantial,” Patent Owner does not state what the fees were or provide any context to assess the magnitude of those fees in the relevant industry. See PO Resp. 43. Patent Owner does not rely on any evidence of alleged commercial success other than the license agreements.

Patent Owner has not established a sufficient nexus between the claimed methods, systems, and devices of the ’044 patent and its licensing activity. We accord Patent Owner’s evidence of licensing the ’044 patent little weight and, given the strong evidence of obviousness explained above, determine that Patent Owner’s evidence does not support a conclusion of nonobviousness of the claims.

d. Conclusion

Based on all of the evidence of record, including evidence of secondary considerations of nonobviousness submitted by Patent Owner, we determine, by a preponderance of the evidence, that claim 1 would have been obvious based on Slavin and Snodgrass under 35 U.S.C. § 103(a).

4. Claims 2, 3, 7–12, and 16–18

Petitioner argues in its Petition that independent claims 1 and 10, as well as dependent claims 2, 3, 7–9, 11, 12, and 16–18 are unpatentable over Slavin and Snodgrass under 35 U.S.C. § 103(a), relying on the testimony of Mr. Stewart in support. Pet. 16–26, 28–29 (citing Ex. 1001). Patent Owner argues that Snodgrass does not teach receiving memory contents “as a result of validation of the security key,” as recited in independent claims 1 and 10.

PO Resp. 40–42. We are not persuaded, for the reasons set forth above.
See supra Section II.B.2.

Patent Owner also argues separately dependent claims 7, 8, and 9, which recite that the “identifier” is a “toll identifier,” “vehicle identifier,” and “account identifier,” respectively.¹¹ PO Resp. 42. Patent Owner contends that “[t]he tag described in Slavin does not contain toll information, vehicle information or account information because that information is stored in the toll plaza computer and central computer,” not the transponder. *Id.* (citing Ex. 2032 ¶¶ 107, 109, 194, 199). We are not persuaded. As Petitioner correctly points out, the claims only require the transponder to store in memory an “identifier” of the various types, not the “information” itself. Reply 23–24. We are persuaded that the unique tag number in Slavin constitutes a “toll identifier,” “vehicle identifier,” and “account identifier” because once it is received from the transponder, it is “correlated by the RSC’s with a *toll account number of the vehicle*.” Ex. 1007, col. 5, ll. 49–52 (emphasis added); *see* Pet. 28–29 (citing Ex. 1001 ¶¶ 399–401, 408–10, 417–19); Reply 23–24. The unique tag number, therefore, serves as an “identifier” of the various types of information. Petitioner further has made a sufficient showing that a person of ordinary skill in the art would have had reason to combine the teachings of Slavin and Snodgrass, using the identifier of Slavin in the TAG or DATA field for purposes of implementing Snodgrass’s communication protocol. *See* Pet. 16–18, 20–21, 28–29.

¹¹ Although Patent Owner argues only claims 7, 8, and 9, we note that claims 16, 17, and 18 recite similar limitations. *See* PO Resp. 42.

With respect to the remaining challenged dependent claims, Patent Owner relies on its arguments with respect to independent claims 1 and 10, and does not argue separately the limitations of the dependent claims. PO Resp. 40–42. We have reviewed the Petition, Patent Owner Response, and Reply, as well as the evidence discussed in each of those papers, and are persuaded, by a preponderance of the evidence, that claims 2, 3, 7–12, and 16–18 would have been obvious based on Slavin and Snodgrass under 35 U.S.C. § 103(a).

5. Claims 19, 20, 23, and 24

With respect to claims 19, 20, 23, and 24, Petitioner states that “Snodgrass and Slavin” disclose all of the recited limitations, but relies solely on its previous arguments as to how Snodgrass anticipates the claims. *See* Pet. 25 (“Ground 1 explains in detail how Snodgrass discloses each element. *See* Ground 1, Claims 19 & 23.”), 29–30 (“*See* Ground 1, Claims 20 & 24.”). Although “anticipation is the ‘epitome of obviousness,’” *Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1363–64 (Fed. Cir. 2008), Petitioner’s ground is based on the combination of the two references, not Snodgrass alone, *see* Pet. 4. Petitioner does not include a detailed explanation differentiating what particular limitations of claims 19, 20, 23, and 24 are taught by Snodgrass versus what limitations are missing from Snodgrass but taught by Slavin. *See id.* at 25, 29–30; *Cohesive*, 543 F.3d at 1364 (“Obviousness can be proven by combining existing prior art references, while anticipation requires all elements of a claim to be disclosed within a single reference.”). Even if Petitioner had done so, Petitioner does not set forth how and why the references’ teachings would have been

combined by a person of ordinary skill in the art. Petitioner provides such an explanation for the combination of Slavin and Snodgrass in the context of similar claims 1, 3, 10, and 12, but that combination involved limitations, such as a “central data base” storing “toll accounts,” for example, that are not present in claims 19, 20, 23, and 24. See Pet. 16–26; *supra* Sections II.C.3, II.C.4. Accordingly, we determine that Petitioner has not shown, by a preponderance of the evidence, that claims 19, 20, 23, and 24 would have been obvious based on Slavin and Snodgrass under 35 U.S.C. § 103(a).

D. Anticipation Ground Based on Hurta

Petitioner argues that claims 1–3, 7, 10–12, 16, 19, 20, 23, and 24 are anticipated by Hurta under 35 U.S.C. § 102(b), relying on the supporting testimony of Mr. Stewart. Pet. 50–60 (citing Ex. 1001). We have reviewed the Petition, Patent Owner Response, and Reply, as well as the evidence discussed in each of those papers, and are persuaded, by a preponderance of the evidence, that claims 1–3, 7, 10–12, 16, 19, 20, 23, and 24 are anticipated by Hurta.

1. Hurta

Hurta describes a toll booth system where an RF interrogator identifies a passing vehicle by communicating with an RF transponder in the vehicle. Ex. 1009, col. 1, ll. 24–55.

Figure 2 of Hurta is reproduced below.

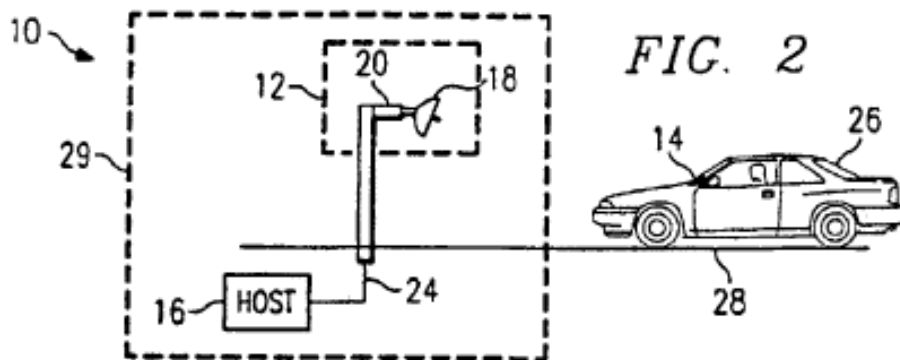


Figure 2 depicts automatic vehicle identification (AVI) system 10 where vehicle 26 with transponder 14 travels on vehicle lane 28 and approaches toll plaza 29. *Id.* at col. 4, ll. 24–34. Transponder 14 includes random-access memory (RAM) 80 and EEPROM 82. *Id.* at col. 6, ll. 43–46, col. 12, ll. 4–10, Fig. 4. Toll plaza 29 includes interrogator 12 with interrogator electronics 20 and antenna 18 for communicating RF signals to and from transponder 14, as well as host computer 16, which controls toll plaza functions and maintains accounting information for transponder 14 and associated smartcard 66. *Id.* at col. 3, l. 32–col. 4, l. 23.

Hurta discloses a toll transaction process that begins with the interrogator sending a wake-up message to alert the transponder that it is in the toll area. *Id.* at col. 7, ll. 23–27. The interrogator then sends a “presentation request” comprising information about the location and acceptable payment methods. *Id.* at col. 7, ll. 27–31. The transponder sends a “presentation response” that informs the interrogator of the transponder’s “identity, the payment method it wishes to use, the vehicle classification information, an authorization code, and similar information, a random number, and the account authorization Message Authentication Code (MAC), which is an encrypted confirmation code.” *Id.* at col. 7, ll. 31–38.

The interrogator then sends a “transaction request” comprising “the fee to be charged, date and time, and a cipher code, which is an encrypted representation of the random number sent” by the transponder in the presentation response. *Id.* at col. 7, ll. 39–44. The transponder “unencrypts the code, and if the code matches the random number sent during the presentation response, the authorization is complete” and the transponder sends a “transaction response” comprising “a status code, a payment ID, and an encrypted MAC to act as a receipt for the transaction.” *Id.* at col. 7, ll. 44–51. The interrogator then “process[es] that information and send[s] back a transaction receipt to terminate the transaction,” and the transponder subtracts the amount of the toll from its “running total of value units stored in the transponder memory 80, 82.” *Id.* at col. 7, ll. 55–59.

2. Analysis

Petitioner has presented evidence showing that Hurta discloses every limitation of claims 1–3, 7, 10–12, 16, 19, 20, 23, and 24. Pet. 50–60. For example, with respect to claim 1, Petitioner argues that Hurta discloses sending a “first communication” (i.e., presentation request) to an “RFID transponder” (i.e., transponder), sending a “second communication” (i.e., transaction request) that includes a “security key” (i.e., encrypted version of the random number previously sent by the transponder), and receiving an “identifier” (i.e., payment ID) as a result of validation of the encrypted random number. *Id.* at 50–52. Petitioner argues that the encrypted random number sent by the transponder “functions as a security key as it is checked and validated to determine whether the tag will respond with the memory contents.” *Id.* at 51–52, 54. Petitioner’s analysis, supported by the

testimony of Mr. Stewart, is persuasive. *See id.* at 50–60; Ex. 1001 ¶¶ 910–1001.

Similar to its arguments regarding Snodgrass, Patent Owner argues that Hurta does not disclose a security key that grants access to the contents of a memory, as recited in independent claims 1, 10, 19, and 23, for three reasons. PO Resp. 44–49. First, Patent Owner argues that “access to the memory contents in Hurta is granted prior to the tag receiving the random number or the encrypted cypher code representative of the random number.” *Id.* at 47–48 (citing Ex. 2032 ¶ 182). Specifically, the presentation response sent from the transponder to the interrogator “includes both identification information and a random number,” which the interrogator can access prior to sending the cipher code and having it checked and validated by the transponder. *Id.* Therefore, Hurta does not grant access to memory contents “as a result of validation of,” or “based on,” a security key according to Patent Owner.

Patent Owner’s argument is not persuasive. As explained above, we do not interpret the claims to require that all data stored in memory be accessible via the security key, as such a reading would be inconsistent with the language of the claims. *See supra* Section II.A.2. Rather, “receiving at least the identifier included in the memory contents . . . as a result of validation of the security key” in claim 1 means being provided with the identifier included in the memory contents based on a key that is checked and validated to grant or deny access to the memory contents. Claim 10 recites a similar limitation. In Hurta, the transponder receives the transaction request with the encrypted random number, checks it against the random number stored in memory, and provides the payment ID from

memory only when there is a match. *See* Ex. 1009, col. 7, ll. 31–51; Pet. 50–55; Ex. 1001 ¶¶ 929–35. Importantly, as with Snodgrass, the transponder does *not* provide the payment ID if there is not a match, as Mr. Goldberg acknowledged. *See* Ex. 1009, col. 7, ll. 31–51; Ex. 1049, 117:1–10 (acknowledging that “[t]he payment ID is sent by the tag back to the reader after the tag unencrypts a code and determine[s] that it matches a random number,” so “some identification information is sent only after the tag verifies that it has received a code that matches its random number”). In other words, access to the payment ID is contingent on a matching random number being sent by the interrogator in the transaction request.

Similarly, “granting access to the memory contents based on the security key” in claim 19 means providing the capability to read certain contents of the memory (i.e., at least the identifier) based on checking and validating the security key. Claim 23 recites a similar limitation. Hurta provides the capability to read the portion of memory in the transponder that stores the payment ID based on checking and validating the encrypted random number. *See* Ex. 1009, col. 7, ll. 31–51; Pet. 55–58; Ex. 1001 ¶¶ 987–94. The fact that other portions of memory, such as the portions storing identification information for the transponder or the random number itself, may be accessed prior to checking and validating the encrypted random number is immaterial, given the broad language of the claim. *See* Reply 17.

Second, similar to its first argument, Patent Owner contends that “Hurta does not protect or secure identification information” because information provided by the transponder in the presentation response, including “its identity, the payment method it wishes to use, the vehicle

classification information, and an authorization code,” would be protected by security, but the information is accessible to the interrogator without providing the encrypted random number. PO Resp. 48 (citing Ex. 2032 ¶¶ 183–84). Patent Owner’s arguments regarding the identification information stored in the transponder’s memory are not persuasive, for the reasons explained above.

Third, Patent Owner argues that “Hurta’s random number or cypher code does not grant or deny access to the memory contents.” *Id.* at 48–49 (citing Ex. 2032 ¶¶ 185–86). Patent Owner contends that

[t]he random number disclosed by Hurta is not included in the presentation request and is also not included in the transaction request. If the cypher code (which is an encrypted representation of the random number) were included in the transaction request in the same way as the security key claimed in the ’044 patent, then Hurta’s tag, having been sent the cypher code by the reader, would reach into its memory and provide information regardless of whether or not an error condition occurs in response to the transaction request, such as the situation in which the balance of currently in the tag is below a minimum balance. It does not. Instead, Hurta’s reader sends the cypher code as part of the transaction request to ensure that is in communication with the specific tag which had originally sent the random number upon which the cypher code is based, not as a security key that is checked and validated to grant or deny access to protected information in the memory.

Id. As explained above, we do not interpret the challenged independent claims to require access to the memory contents to be granted based only on checking and validating the security key; the system may check other information as well. *See supra* Section II.A.2. Accordingly, the fact that other checks also may be performed, and error messages returned (e.g., if the balance of the transponder’s account is too low), is immaterial, given that

Hurta discloses receiving an encrypted random number, checking it against the random number stored in memory, and providing the payment ID from memory when the random numbers match. *See* Reply 18–20. Further, the fact that the random number *also* serves the purpose of identifying the transponder that originally sent the random number does not negate the fact that it is used by the transponder to perform a comparison and only provide data from memory in the case of a match. *See id.* at 16–17. We agree with Petitioner that the encrypted random number in Hurta is a key that is checked and validated to grant or deny access to a memory. *See* Pet. 50–58.

We are persuaded that Hurta discloses every limitation of independent claims 1, 10, 19, and 23, for the reasons provided by Petitioner. *See id.* With respect to dependent claims 2, 3, 7, 11, 12, 16, 20, and 24, Patent Owner relies on its arguments with respect to the independent claims, and does not argue separately the limitations of the dependent claims. PO Resp. 49; *see* Pet. 58–60. We have reviewed the Petition, Patent Owner Response, and Reply, as well as the evidence discussed in each of those papers, and are persuaded, by a preponderance of the evidence, that claims 1–3, 7, 10–12, 16, 19, 20, 23, and 24 are anticipated by Hurta under 35 U.S.C. § 102(b).

III. ORDER

Petitioner has demonstrated, by a preponderance of the evidence, that claims 19, 20, 23, and 24 are anticipated by Snodgrass under 35 U.S.C. § 102(b); claims 1–3, 7–12, and 16–18 are unpatentable over Slavin and Snodgrass under 35 U.S.C. § 103(a); and claims 1–3, 7, 10–12, 16, 19, 20, 23, and 24 are anticipated by Hurta under 35 U.S.C. § 102(b). Petitioner has not demonstrated, by a preponderance of the evidence, that claims 19, 20,

23, and 24 are unpatentable over Slavin and Snodgrass under 35 U.S.C. § 103(a).

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–3, 7–12, 16–20, 23, and 24 of the '044 patent have been shown to be unpatentable.

This is a final 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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PETITIONER:

Gregg F. LoCascio
Nathan S. Mammen
KIRKLAND & ELLIS LLP
gregg.locascio@kirkland.com
nathan.mammen@kirkland.com

PATENT OWNER:

Noel C. Gillespie
Victor M. Felix
Robert H. Sloss
PROCOPIO, CORY, HARGREAVES & SAVITCH LLP
gail.poulos@procopio.com