

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MOBILE TECH, INC.,
Petitioner,

v.

INVUE SECURITY PRODUCTS INC.,
Patent Owner.

Case IPR2016-01915
Patent 7,737,844 B2

Before JUSTIN T. ARBES, STACEY G. WHITE, and
DANIEL J. GALLIGAN, *Administrative Patent Judges*.

ARBES, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a)

I. BACKGROUND

Petitioner Mobile Tech, Inc. filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–19 of U.S. Patent No. 7,737,844 B2 (Ex. 1001, “the ’844 patent”) pursuant to 35 U.S.C. § 311(a). On March 30, 2017, we instituted an *inter partes* review of claims 1–7, 12–14, and 17–19 on two grounds of unpatentability. Paper 7 (“Dec. on Inst.”). Patent Owner InVue Security Products Inc. subsequently filed a Patent Owner Response (Paper 15, “PO Resp.”) and Petitioner filed a Reply (Paper 16, “Reply”). An oral hearing was held on November 15, 2017, and a transcript of the hearing is included in the record (Paper 20, “Tr.”). Patent Owner’s Motion to Terminate (Paper 27) also was denied. Paper 34.

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–7, 14, and 17–19 are unpatentable, but Petitioner has not shown by a preponderance of the evidence that claims 12 and 13 are unpatentable.

A. *The ’844 Patent*¹

The ’844 patent pertains to “systems and methods for protection of merchandise,” in particular a “programming station for use in a security system wherein a smart key is programmed with a security disarm code (SDC) at the programming station by wireless communication, which is

¹ Cases IPR2016-00892, IPR2016-00895, IPR2016-00896, IPR2016-00898, IPR2016-00899, IPR2016-01241, IPR2017-00344, IPR2017-00345, IPR2017-01900, IPR2017-01901, IPR2018-00481, and PGR2018-00004 involve the same parties and different patents. See Paper 21, 3–4.

subsequently used to program the SDC code into various security devices adapted to be attached to items of merchandise.” Ex. 1001, col. 1, ll. 15–22. According to the ’844 patent, retail establishments used various types of security systems to prevent shoplifting, such as attaching a security device to a piece of merchandise and using a “key” “to unlock the device from the protected item of merchandise to enable the merchandise to be taken to a checkout counter, as well as to disarm an alarm contained in the security device.” *Id.* at col. 1, ll. 24–46. A problem with such systems was that the key could be “stolen from the retail establishment and used at the same establishment or at another store using the same type of security device, to enable a thief to disarm the security device as well as unlock it from the protected merchandise.” *Id.* at col. 1, ll. 46–51. The system disclosed in the ’844 patent purports to solve that problem by programming an SDC that is “unique to a particular store” into the key using a programming station, “thereby preventing the key from being used at a different store than that from which the key is stolen,” and deactivating the SDC after a preset time period. *Id.* at col. 1, l. 62–col. 2, l. 15, col. 5, ll. 58–64.

Figure 1 of the '844 patent is reproduced below.

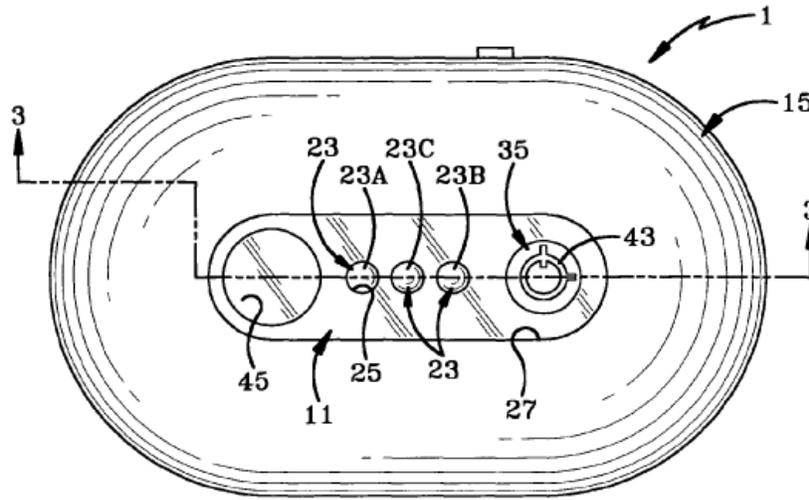


FIG-1

Figure 1 depicts a top view of programming station 1 comprising, *inter alia*, base plate 3 on which is mounted a printed circuit board containing a logic control circuit, housing cover 15 (made of, for example, a rigid plastic material), shell 11 (made of, for example, an infrared clear plastic material), smart key receiving programming port 45, power on/off switch 35, key receiving opening 43, and light-emitting diodes (LEDs) 23A–C indicating the status of programming station 1. *Id.* at col. 3, l. 34–col. 4, l. 26.

Programming station 1 may be secured (e.g., via bolts or screws) “in a secure location such as in the store manager’s office to prevent possible theft of the programming station.” *Id.* at col. 3, ll. 51–54.

Figure 8 of the '844 patent is reproduced below.

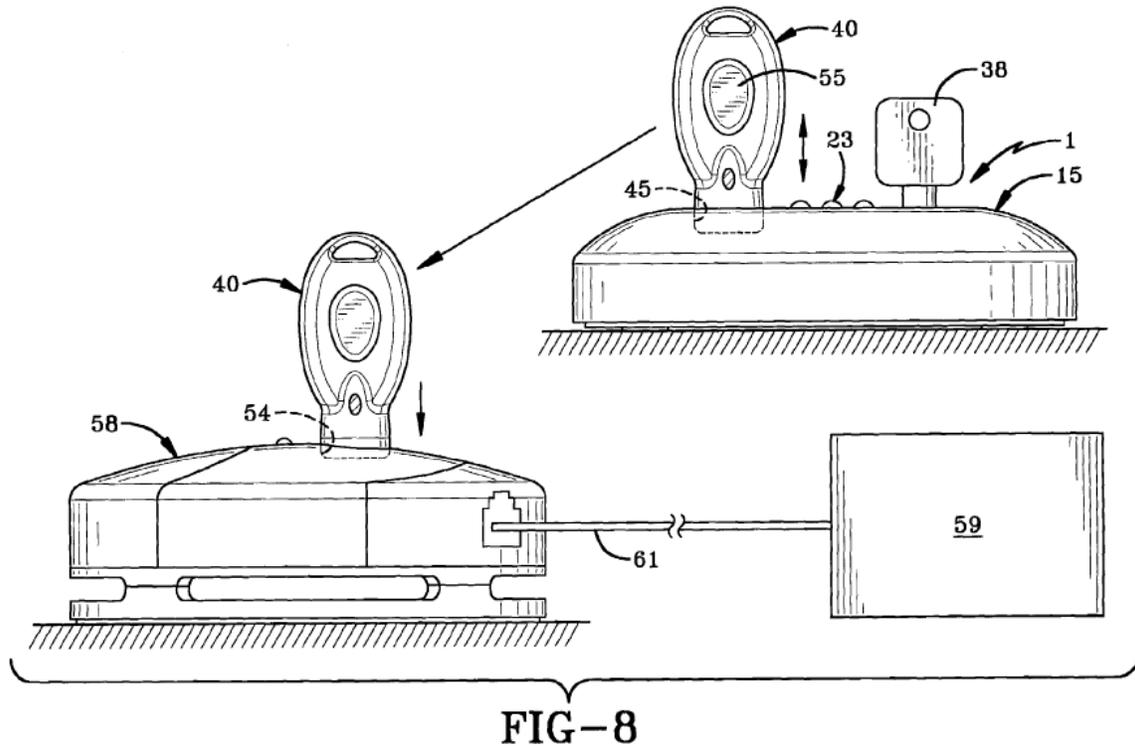


Figure 8 depicts a side view of programming station 1, with key 38 and key 40 having control switch or push button 55 inserted. *Id.* at col. 4, ll. 46–62. Figure 8 also depicts key 40 inserted in security device 58 attached to merchandise 59 by cable 61. *Id.* at col. 4, l. 62–col. 5, l. 9. The user first actuates power on/off switch 35 using key 38, then presses control switch or push button 55 on key 40, which initiates infrared (IR) wireless communication between key 40 and logic control circuit 7 within programming station 1. *Id.* at col. 4, ll. 56–60. Logic control circuit 7 generates an SDC, stores it permanently in memory, and communicates it to key 40. *Id.* at col. 4, ll. 60–66. Key 40 then can be used to program the SDC into security device 58 by placing it in key receiving port 54 and wirelessly communicating the SDC from key 40 to security device 58. *Id.* at col. 4, ll. 62–66. The SDC may be “randomly generated the first time that

programming station 1 is actuated at a particular retail establishment and used to program a key 40” and also used to reprogram a key “after a timing circuit in the key[] has removed the previously programmed SDC therefrom.” *Id.* at col. 5, ll. 16–28. For example, a key may have “an internal timer which deactivates the SDC after a preset time period, for example 96 hours, which prevents stolen keys from being reused in the same store after this time period.” *Id.* at col. 5, ll. 58–64.

B. Illustrative Claim

Claim 1 of the ’844 patent recites:

1. An apparatus for generating and retaining a security code for use in a security system for protecting items of merchandise, said apparatus comprising:

a housing;

a logic control circuit located within said housing, said control circuit including:

a) a controller for generating the security code;

b) a memory for storing the generated security code;

c) a wireless communication system for interfacing with a programmable key used for operating a security device attached to an item of merchandise; and

d) a visual display for indicating the status of the logic control circuit.

C. Prior Art

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

U.S. Patent Application Publication No. 2004/0003150 A1, published Jan. 1, 2004 (Ex. 1004, “Deguchi”);

U.S. Patent Application Publication No. 2004/0201449 A1, published Oct. 14, 2004 (Ex. 1002, “Denison”);

U.S. Patent Application Publication No. 2005/0165806 A1, filed Dec. 13, 2004, published July 28, 2005 (Ex. 1003, “Roatis”); and

U.S. Patent No. 4,117,465, issued Sept. 26, 1978 (Ex. 1005, “Timblin”).

D. Pending Grounds of Unpatentability

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

References	Basis	Claim(s)
Denison, Roatis, and Deguchi	35 U.S.C. § 103(a) ²	1–7, 12, 13, and 17–19
Denison, Timblin, Roatis, and Deguchi	35 U.S.C. § 103(a)	14

II. ANALYSIS

A. Claim Interpretation

The Board interprets claims in an unexpired patent using the “broadest reasonable construction in light of the specification of the patent in which [they] appear[.]” 37 C.F.R. § 42.100(b); *see also Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). Under this standard, we interpret claim

² The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. Because the challenged claims of the ’844 patent have an effective filing date before the effective date of the applicable AIA amendments, we refer to the pre-AIA version of 35 U.S.C. § 103.

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). “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.” *Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1062 (Fed. Cir. 2016). Our interpretation “‘cannot be divorced from the specification and the record evidence,’ and ‘must be consistent with the one that those skilled in the art would reach.’ A construction that is ‘unreasonably broad’ and which does not ‘reasonably reflect the plain language and disclosure’ will not pass muster.” *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015) (citations omitted), *overruled on other grounds by Aqua Prods., Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017).

For purposes of this Decision, we conclude that only the phrase “logic control circuit located within said housing” in claims 1 and 17 requires express interpretation.³ Based on the briefing submitted during trial, the parties dispute the phrase in two respects. First, the parties dispute the meaning of “logic control circuit.” Petitioner originally proposed in its

³ In the Decision on Institution, we interpreted the phrase “invalidating the security code stored in the key” in claim 15. Dec. on Inst. 7–10. Because we did not institute a trial on claim 15, however, that term no longer requires interpretation. We also agree with Patent Owner that no interpretation is necessary for various other terms proposed by Petitioner. *See* Pet. 8–11; PO Resp. 5–6.

Petition that the term should be interpreted to mean “a ‘collection of computer components’ that perform the functionality recited in the claims.” Pet. 7–8. Patent Owner responds that Petitioner’s proposed interpretation is too broad because it omits the word “circuit,” pointing out that Petitioner’s declarant, Thaine H. Allison III, acknowledged that the “collection of components would necessarily need to be connected through a circuit.” PO Resp. 4 (quoting Ex. 2002, 20:11–25). During the oral hearing, Patent Owner agreed with an interpretation of “a collection of computer components that are connected through a circuit.” Tr. 23:4–16. Petitioner likewise states that connection through a “circuit” should be part of the interpretation. Reply 2 (citing Ex. 2002, 20:21–25). We agree as well.

Claim 1 recites a “logic control circuit . . . including” a collection of four components: a “controller,” “memory,” “wireless communication system,” and “visual display.” Claim 17 recites a “logic control circuit . . . including” a “memory” and “communication system.” The Specification of the ’844 patent similarly describes a collection of components connected through a circuit. Programming station 1 includes “printed circuit board 5, which contains a logic control circuit indicated generally at 7.” Ex. 1001, col. 3, ll. 36–39.

Figure 6 of the '844 patent is reproduced below.

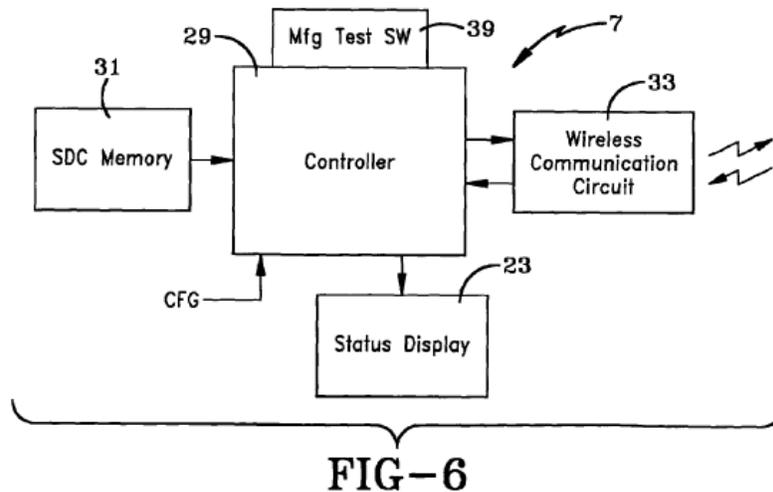


Figure 6 depicts logic control circuit 7, which “includes a main controller 29,” “an SDC memory 31,” “a wireless communication circuit 33,” and status display 23, which “preferably consists of three LEDs 23 which are mounted on spacer 9 and electrically connected to circuit board 5 by conductors 24.” *Id.* at col. 3, l. 59–col. 4, l. 13. Logic control circuit 7 can include other components as well, such as on/off switch 35. *Id.* at col. 4, ll. 32–38. According to the '844 patent, “[t]he particular details and construction of the logic control circuit can vary from that shown in the drawings and described . . . without affecting the main concept of the invention.” *Id.* at col. 4, ll. 27–30. Thus, we are persuaded that the interpretation agreed to by Patent Owner at the hearing—“a collection of computer components that are connected through a circuit”—is consistent with the language of the claims themselves and the Specification of the '844 patent.

Second, the parties dispute what it means for the logic control circuit to be located “within” the housing. Patent Owner argues that the logic control circuit (including all four recited components) must be contained in a

single housing. PO Resp. 12–13. Petitioner disagrees, arguing that the logic control circuit need only be “at least partially within one or more housings” and relying on *Baldwin Graphic Systems, Inc. v. Siebert, Inc.*, 512 F.3d 1338 (Fed. Cir. 2008). Reply 3–6 (emphases omitted). Upon review of the parties’ arguments, we agree with Patent Owner.⁴

In *Baldwin*, the U.S. Court of Appeals for the Federal Circuit stated that

this court has repeatedly emphasized that an indefinite article “a” or “an” in patent parlance carries the meaning of “one or more” in open-ended claims containing the transitional phrase “comprising.” That “a” or “an” can mean “one or more” is best described as a rule, rather than merely as a presumption or even a convention. The exceptions to this rule are extremely limited: a patentee must evince[] a clear intent to limit “a” or “an” to “one.” The subsequent use of definite articles “the” or “said” in a claim to refer back to the same claim term does not change the general plural rule, but simply reinvokes that non-singular meaning. An exception to the general rule that “a” or “an” means more than one only arises where the language of the claims themselves, the specification, or the prosecution history necessitate a departure from the rule.

512 F.3d at 1342–43 (citations and quotation marks omitted; second alteration in original). Here, the claims recite an apparatus (claim 1) and programming station (claim 17) “comprising” “a housing” and “a logic control circuit located within said housing,” the logic control circuit “including” various components. Thus, by using “a” and “comprising,” the claims permit the device to have more than one housing (and more than one logic control circuit). Based on the language of the claims and the

⁴ As explained herein, though, we are persuaded by Petitioner’s arguments that the claims would have been obvious even if they require the logic control circuit to be contained in a single housing. *See infra* Section II.D.4.

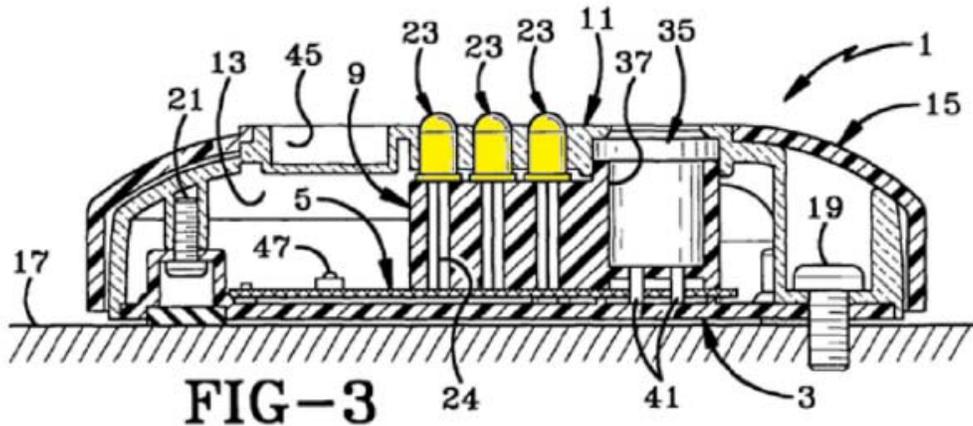
Specification, however, we are persuaded that the claims require at least one logic control circuit to be within a single housing. In other words, the components of the recited logic control circuit cannot be distributed across multiple housings, as Petitioner contends. *See* Reply 3–6.

The claim language specifies the relationship between two recited components, i.e., the logic control circuit must be located “within” the housing. If part of a logic control circuit was in one housing and part in another housing (i.e., outside the first housing), as Petitioner suggests, the logic control circuit could not be considered “within” a housing. This is consistent with the language of the dependent claims as well, which refer to “the housing” as a singular structure, never referring to multiple different housings. For example, claim 7 recites that “the housing has an internal chamber,” claim 8 recites that “the housing includes a base plate, a main housing shell,” an “internal spacer,” and a “cover plate,” and claim 12 recites “a mechanical key activated ON/OFF switch mounted in the housing and operatively connected to the logic control circuit.”

Similarly, the Specification of the ’844 patent describes and depicts the components of logic control circuit 7 as within a single physical housing (programming station 1 having an outside made up of base plate 3, dome-shaped housing shell 11, spacer 9, and housing cover 15, and an inside of internal chamber 13). Ex. 1001, col. 3, ll. 34–67, Figs. 1–3A. The Specification never describes logic control circuit 7 as being partially in one housing and partially in another. Rather, the Specification consistently refers to just one housing having all of the described components. *See id.*

We also disagree with Petitioner’s argument that one component of the logic control circuit described in the Specification—LEDs 23—is located

partially outside the housing. *See* Reply 5–6. Petitioner provides on page 6 of its Reply the following version of Figure 3 of the '844 patent, with LEDs 23 colored in yellow.



As shown in Figure 3 above, LEDs 23 extend through openings 25 in housing shell 11, such that the outer bulb-shaped covers of the LEDs (which would permit light to shine through) constitute the outer portion of the housing itself at those openings. *See* Ex. 1001, col. 3, ll. 62–65, Fig. 2. The LEDs that emit light, as well as the electrical connections to the other components of the logic control circuit, are located below the outer bulb-shaped covers (i.e., within the housing). Thus, we are persuaded that the claim language and Specification of the '844 patent demonstrate that the applicants meant for the singular meaning of “located within said housing” to apply.⁵

⁵ Petitioner’s position also would result in the illogical result that the claims would cover the situation where some components of the logic control circuit (e.g., a “controller,” “memory,” and “wireless communication system” as in claim 1) are located in one housing, and other components (e.g., a “visual display” as in claim 1) are located in another housing in a different physical location but connected electrically to the first housing. *See* Tr. 12:22–13:26. We are not persuaded that that arrangement is

Baldwin is distinguishable from the present situation. That case involved the claim language “a pre-soaked fabric roll” and subsequent recitations of “said fabric roll,” which found antecedent basis in the original phrase. 512 F.3d at 1340, 1343. The Court held that neither language was limited to a single fabric roll because the claim language and specification did not show “a clear indication that the applicant departed from the general rule for the article ‘a.’” *Id.* at 1343. The claim in *Baldwin* did not include any language like the “within” phrasing present here, and the specification’s discussion of fabric rolls permitted contact with multiple fabric rolls. *See id.*

We view the instant situation as more analogous to that of *TiVo, Inc. v. EchoStar Communications Corp.*, 516 F.3d 1290 (Fed. Cir. 2008). The claims in that case recited “wherein said Output Section assembles said video and audio components into an MPEG stream.” *Id.* at 1303. The appellant argued that the limitation “covers only the assembly of audio and video components into a single, interleaved MPEG stream,” whereas the appellee argued that it “also covers the assembly of each component, audio and video, into its own separate stream.” *Id.* The Court agreed with the appellant, distinguishing *Baldwin* and concluding that “the claims and written description . . . make clear that the singular meaning applies.” *Id.* The Court determined that the claim language “in context clearly indicate[d]” assembly into a single stream, particularly given the fact that, although the claim preamble used “comprising,” the assembly limitation itself did not use “comprising.” *Id.* at 1303–1304. Thus, the claims in *TiVo* recited the relationship of one feature to another (the video and audio

consistent with the claim language or Specification, for the reasons explained herein.

components assembled “into” an MPEG stream), similar to the instant claims (the logic control circuit “within” the housing), which also do not use “comprising” in the logic control circuit limitation itself. Further, the specification of the patent at issue in *TiVo* described assembly into “a single stream,” *id.* at 1304, similar to the Specification of the ’844 patent, which describes a logic control circuit within a single housing.

Accordingly, applying the broadest reasonable interpretation of the claims in light of the Specification, and taking into account the parties’ arguments made during trial, we interpret “logic control circuit located within said housing” to mean a collection of computer components that are connected through a circuit and located within a single housing.

B. Principles of Law

To prevail in challenging claims 1–7, 12–14, and 17–19 of the ’844 patent, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). A claim is unpatentable for obviousness if, to one of ordinary skill in the pertinent art, “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.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting 35 U.S.C. § 103(a)). The question of obviousness is resolved on the basis of underlying factual determinations, including “the scope and content of the prior art”; “differences between the prior art and the claims at issue”; and “the level of

ordinary skill in the pertinent art.”⁶ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

A patent claim “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 550 U.S. at 418. An obviousness determination requires finding “both ‘that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.’” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016) (citation omitted); *see KSR*, 550 U.S. at 418 (for an obviousness analysis, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does”). A motivation to combine the teachings of two references can be “found explicitly or implicitly in market forces; design incentives; the ‘interrelated teachings of multiple patents’; ‘any need or problem known in the field of endeavor at the time of invention and addressed by the patent’; and the background knowledge, creativity, and common sense of the person of ordinary skill.” *Plantronics, Inc. v. Aliph, Inc.*, 724 F.3d 1343, 1354 (Fed. Cir. 2013) (citation omitted). Further, an assertion of obviousness “cannot be sustained by mere conclusory statements; instead, there must be some

⁶ Additionally, secondary considerations, such as “commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.” *Graham*, 383 U.S. at 17–18. Patent Owner, however, has not presented any such evidence.

articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR*, 550 U.S. at 418 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); *In re Nuvasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (a finding of a motivation to combine “must be supported by a ‘reasoned explanation’” (citation omitted)).

C. Level of Ordinary Skill in the Art

Petitioner argues that “[t]he level of ordinary skill in the art [for the ’844 patent] is evidenced by the prior art.” Pet. 13. Petitioner’s declarant, Mr. Allison, testifies that a person of ordinary skill in the art at the time of the ’844 patent

would have had a four year technical degree (*e.g.* B.S. engineering) with a minimum of three years of experience in using, provisioning, designing or creating, or supervising the design or creation, of . . . theft prevention devices, and other related security devices. Extended experience in the industry could substitute for a technical degree.

A [person of ordinary skill in the art] would have known how to research the technical literature in fields relating to theft prevention, including in retail and other environments, as well as security in general. Also, a [person of ordinary skill in the art] may have worked as part of a multidisciplinary team and drawn upon not only his or her own skills, but also taken advantage of certain specialized skills of others in the team, *e.g.*, to solve a given problem. For example, designers, engineers (*e.g.*, mechanical or electrical), and computer scientists or other computer programmers may have been part of a team.

Ex. 1013 ¶¶ 20–21. Patent Owner provides a slightly different skill level, arguing that a person of ordinary skill in the art would have had “the equivalent of a four-year Bachelor of Science degree in electrical engineering, computer engineering, or computer science,” and

“approximately two to five years of professional experience [with training] in electronics including microcontrollers, and embedded programming for microcontrollers.” PO Resp. 7.

Neither party explains in detail why the respective proposed level of ordinary skill in the art should be adopted nor how the different levels affect the parties’ analyses. Although there are slight differences between the proposed levels of ordinary skill in the art, Patent Owner and Mr. Allison agree that an ordinarily skilled artisan would have had a four-year technical degree or the equivalent and some amount of professional experience. Based on the evidence of record, including the testimony of the parties’ declarants, the subject matter at issue, and the prior art of record, we determine that a person of ordinary skill in the art would have had a four-year technical degree or equivalent experience with a minimum of two years of professional technical experience in the field of theft prevention devices or related security devices. We apply this level of ordinary skill in the art for purposes of this Decision.

*D. Obviousness Ground Based on Denison, Roatis, and Deguchi
(Claims 1–7, 12, 13, and 17–19)*

1. Denison

Denison discloses vending machines equipped with programmable electronic locks. Ex. 1002 ¶ 2. As used in Denison, a “vending machine” is “a device that performs a money transaction, which may involve the insertion of cash or commercial paper, or the swiping of a credit and/or debit card, and may (but [is] not required to) dispense an item or items or provide functions in response to the money transaction,” and broadly covers

“machines commonly used for vending drinks and snacks, ATM stations, change machines, toll machines, coin-operated laundry machines, video arcades, etc.” *Id.* ¶ 36. Access to the contents of the disclosed vending machine is controlled by an electronic lock and electronic key. *Id.* ¶ 7. To unlock the electronic lock and open the vending machine, there must be a match between the code stored in the electronic key and the code stored in the electronic lock. *Id.* ¶ 42. Figure 1 of Denison is reproduced below.

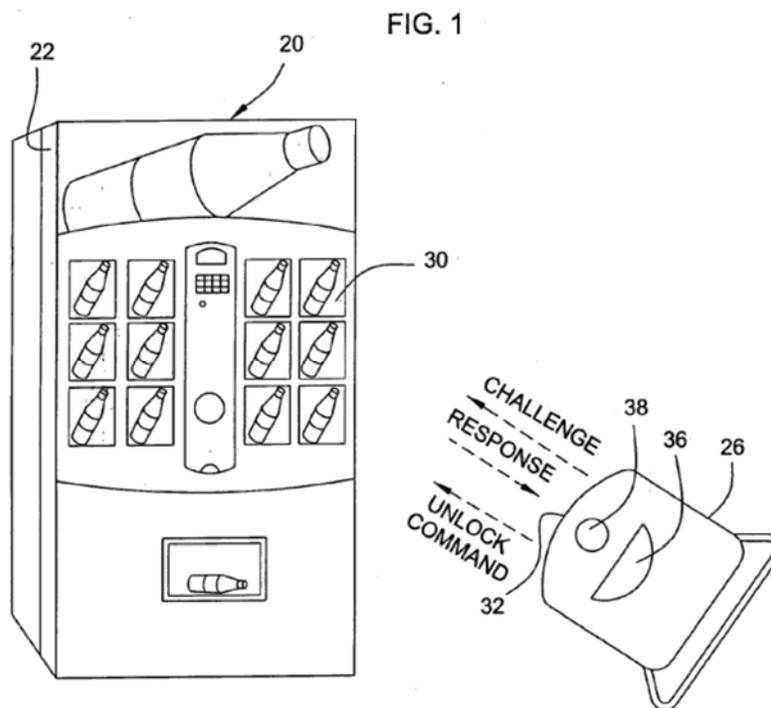


Figure 1 is a schematic view of Denison’s vending machine and electronic lock. *Id.* ¶¶ 15, 36–37. Vending machine 20 has front panel or door 22 that can be opened when the electronic lock is wirelessly unlocked using properly programmed electronic key 26. *Id.* ¶¶ 36–37.

¶¶ 69, 80. Personal computer 32 may display a user interface screen for setting parameters and programming the electronic key. *Id.* ¶ 80, Fig. 5B.

3. Deguchi

Deguchi is directed to “portable electronic devices and appliances with [a] built-in, integrated communication port for direct connection to a host device for data transfer.” Ex. 1004 ¶ 2. Figure 6B of Deguchi is reproduced below.

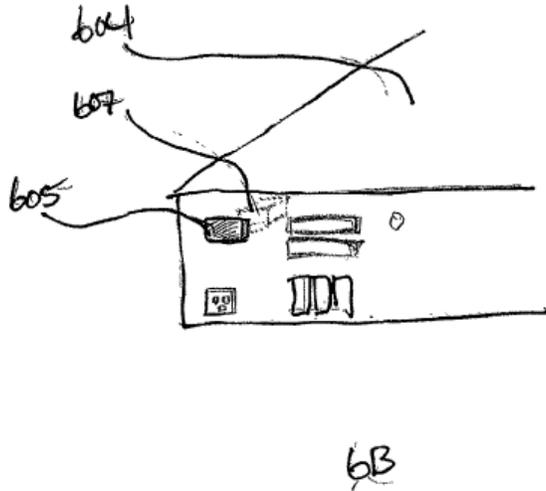


Figure 6B depicts a host device with infrared transceiver 607 and infrared communication interface port 605 for communicating with a portable device via infrared data transfer. *Id.* ¶¶ 39–42. Deguchi discloses that

personal digital assistants and other portable electronic devices generally require an intermediary cable connection to communicate with a host device for data transfer, exchange and the like. With the rise in the number of different types of such devices, it would be desirable to provide portable electronic devices or appliances which have integrated communication port for direct connection to a host device for data exchange and storage without the need for an intermediary type connection such as a cradle.

Id. ¶ 14.

4. Claim 1

a. Whether Denison, Roatis, and Deguchi Collectively Teach All of the Limitations of Claim 1

Petitioner explains in detail how Denison, Roatis, and Deguchi⁷ collectively teach every limitation of claim 1, relying on the testimony of Mr. Allison as support. *See* Pet. 13–27; Ex. 1013 ¶¶ 102–124. Petitioner relies on Denison for the majority of the limitations of claim 1. Pet. 13–27. For example, Petitioner argues that Denison teaches an “apparatus” (i.e., the external computing device, which may be a laptop computer) comprising a “housing” (i.e., the laptop computer housing) and a “logic control circuit” (i.e., “a microprocessor, memory, an on/off switch, communications components (*e.g.*, wireless or wired), and other components” of the laptop computer). *Id.* at 18–20. Petitioner contends that Denison’s external computing device includes a “controller” (i.e., microprocessor) for generating a “security code” (i.e., the access code), “memory” for storing the access code, a “communication system” (i.e., the external computing device and cradle) for interfacing with a “programmable key” (i.e., the electronic key), and a “visual display” (i.e., the “display/monitor” of the external computing device). *Id.* at 20–25. Petitioner further argues that, “[w]hile not entirely apparent from Denison,” the communication between the cradle and electronic key is “wireless” because the electronic key only has an infrared communication interface, and “no non-wireless interface in the key is disclosed.” *Id.* at 14–15, 22–23.

⁷ Denison, Roatis, and Deguchi were not of record during prosecution of the ’844 patent. *See* Ex. 1001, (56); Pet. 3.

Petitioner relies on Roatis and Deguchi for certain limitations of claim 1. First, with respect to the requirement of a “wireless” communication system for interfacing with the programmable key, Petitioner contends that even if Denison’s cradle does not communicate wirelessly, it would have been obvious to modify Denison’s system to use a wireless cradle, as taught by Roatis. *Id.* at 16, 24 (citing Ex. 1003 ¶¶ 69, 80, 129, claim 2). Second, claim 1 requires a “visual display” included in the logic control circuit that is “for indicating the status of the logic control circuit.” Petitioner again argues that a person of ordinary skill in the art would have been motivated to use Roatis’s cradle, which has a ready/wait light (and corresponding user interface on the computer) that indicates the status of the logic control circuit, such as “ready, waiting or communicating with the ‘electronic key,’” in the system of Denison. *Id.* at 17–18, 26–27 (citing Ex. 1003 ¶¶ 69, 80). Third, claim 1 requires that the wireless communication system and visual display be included in the logic control circuit “located within said housing,” but Denison and Roatis each disclose a cradle separate from the computer. *Id.* at 16–17, 23–27. Petitioner contends that it would have been obvious to integrate the cradle into the external computing device of Denison (such that all of the necessary components would be located within a single housing) based on Deguchi, which states that it is “desirable” to provide for a direct connection between a portable device and host device rather than using a cradle. *Id.* (citing Ex. 1004 ¶ 14).

As an initial matter, we determine whether Denison teaches a “wireless” communication system for interfacing with a programmable key. *See id.* at 14–15, 22–23. Although Denison does not state explicitly that the communication between the cradle and electronic key is “wireless,” we find

that a person of ordinary skill in the art would have understood that to be the case. Denison discloses an electronic key that has “a half-duplex [Infrared Data Association (IrDA)] infrared communication interface . . . for communicating with the electronic lock of a vending machine or *with a computer for programming the key.*” Ex. 1002 ¶ 41 (emphasis added), Fig. 4 (depicting that the interface is for “2-Way Communication (IRDA)”). This disclosure directly ties to Denison’s subsequent discussion of Figures 17 and 18, where Denison discloses the use of a cradle connected to the external computing device (e.g., a laptop *computer*) to *program* the electronic key.⁸ *Id.* ¶¶ 78, 85 (“[t]he external computing device 426 may optionally be used to program an electronic key 410,” whereby “the access code . . . is transmitted via the cradle into the key”), Figs. 17, 18. The electronic key then can be used to access the vending machine by “wirelessly communicating” (e.g., via “infrared”) with the access control transceiver in the electronic lock. *Id.* ¶¶ 77, 85, Fig. 17; *see* Tr. 29:7–23 (Patent Owner acknowledging that Denison’s “key is a wireless key”). We agree with Petitioner and Mr. Allison that the only mechanism by which the electronic key in Denison communicates is wireless; there is no non-wireless communication disclosed. *See* Pet. 14–15, 22–23; Ex. 1013 ¶¶ 107–109.

As such, and based on Denison’s description above of using infrared communication for the computer to program the electronic key, we are persuaded that a person of ordinary skill in the art would have understood

⁸ Although certainly not dispositive, we also note that Figure 17 of Denison depicts a wired connection between external computing device 426 and cradle 430, but shows no such wired connection between cradle 430 and electronic key 410.

Denison to teach a “wireless” communication system for interfacing with a programmable key, as recited in claim 1. Thus, the first modification to Denison proposed by Petitioner—implementing “wireless” communication based on Roatis—is unnecessary. Regardless, though, we are persuaded by Petitioner’s arguments that Roatis also teaches “wireless” communication. *See* Pet. 16, 24; Ex. 1003 ¶¶ 69 (disclosing “wireless transmission” from the key and an “interface device for forwarding and receiving communications to and from [the] electronic key”), 129, claim 2 (“the cradle communicates with the key through wireless transmissions”). Petitioner’s analysis for each of the limitations of claim 1, supported by the testimony of Mr. Allison, which we credit, is persuasive.

Patent Owner makes three arguments. First, Patent Owner argues that Petitioner “fails to specifically identify the ‘logic control circuit’ within Denison or any other reference.” PO Resp. 11–12. Patent Owner acknowledges that “Denison may contain a collection of computer components,” but contends that Petitioner has not shown how the alleged collection “forms a ‘circuit’ for controlling the logic of the apparatus.” *Id.* at 12. We disagree. As explained above, we interpret “logic control circuit located within said housing” to mean a collection of computer components that are connected through a circuit and located within a single housing. *See supra* Section II.A. Petitioner has shown that Denison teaches each of the components recited in claim 1, namely a “controller,” “memory,” “wireless communication system,” and “visual display,” which are part of a circuit because they electrically communicate with each other; otherwise, the device would not work as described in Denison. *See* Pet. 18–25; Reply 3. The modifications to Denison’s system proposed by Petitioner do not change

this. Roatis's cradle electrically communicates with the computer just as in Denison, and integrating a cradle into a computer as taught by Deguchi still results in the components being electrically connected through a circuit. *See* Pet. 16–18, 24–27. Thus, we disagree with Patent Owner's argument that the cited references fail to teach a "logic control circuit."

Second, Patent Owner argues that Deguchi does not teach integrating "the functionality of a cradle into the housing of a computer," as Petitioner contends. PO Resp. 12–16. Instead, according to Patent Owner, Deguchi only discloses "a manner of providing a direct connection between a portable device (*e.g.*, [personal digital assistant (PDA)], phone) by integrating the communication interface of the cradle *into the portable device.*" *Id.* (citing Ex. 1004, Abstract, ¶¶ 14, 31, 39, 50, claim 1).

Patent Owner's argument, however, does not address Petitioner's asserted obviousness combination. As explained above, Denison's cradle is separate from the external computing device. Consequently, Petitioner relies on Deguchi as suggesting the integration of the former into the latter, such that all four recited components of the logic control circuit in the combined device would be contained within a single housing. Pet. 16–17, 24–25. Petitioner's asserted combination is not based on adding any functionality into Denison's electronic key (a portable device), but rather moving functionality from Denison's cradle to the external computing device. *See id.* Indeed, as Petitioner points out, it would not make sense to integrate any infrared communication capability into Denison's electronic key, as it already has such capability. *See* Reply 10; Ex. 1002, Fig. 4.

Moreover, we do not agree that a person of ordinary skill in the art would have read Deguchi in such a limited manner as asserted by Patent

Owner. *See* PO Resp. 12–16. Petitioner relies on the following paragraph of Deguchi:

In this manner, personal digital assistants and other portable electronic devices generally require an intermediary cable connection to communicate with a host device for data transfer, exchange and the like. With the rise in the number of different types of such devices, it would be desirable to provide portable electronic devices or appliances which have integrated communication port for *direct connection to a host device for data exchange and storage without the need for an intermediary type connection such as a cradle.*

Ex. 1004 ¶ 14 (emphasis added); *see* Pet. 17. Thus, regardless of what changes Deguchi describes as being made to a portable device to enable communication, Deguchi expressly discloses a “direct connection” to a “host device” (e.g., a computer) without the need for a cradle. Petitioner further points to how this direct connection is accomplished. Pet. 17, 24–25.

Figure 6B of Deguchi shows infrared transmitter and receiver (transceiver) 607 “to enable data transmission and reception via infrared communication interface port 605,” both of which are part of host device 6B. Ex. 1004 ¶¶ 39–40. Communication functionality exists in both portable device 6A (via infrared data transfer interface port 603 and infrared transmitter and receiver (transceiver) 606) and host device 6B (via infrared communication interface port 605 and infrared transmitter and receiver (transceiver) 607), without the need for a cradle in between the two. *See id.* Petitioner’s arguments are supported by the disclosure of Deguchi and the testimony of Mr. Allison, and are persuasive. *See id.* ¶¶ 14, 39–40; Ex. 1013 ¶¶ 117–120.

Third, similar to the preceding argument, Patent Owner contends that “employing the teachings of Deguchi would have had the effect of *completely separating* what [Petitioner] asserts is the ‘visual display’ in

Roatis (LED lights on the cradle) from the housing of the computer.”
PO Resp. 16. According to Patent Owner, if a person of ordinary skill in the art would have modified the combined device at all based on Deguchi, “then the [person of ordinary skill in the art] would have also followed Deguchi’s teachings and integrated the ready/wait light 40 and user interface from Roatis’[s] cradle *into the portable device* shown in Figure 6A.” *Id.* at 16–17. We disagree. Again, Petitioner’s asserted combination is based on using Roatis’s cradle (and associated functionality) in Denison’s system, not modifying Denison’s electronic key, and Deguchi provides an express motivation for why a person of ordinary skill in the art would have been motivated to integrate such cradle functionality into a computer like the one described in Denison, such that all of the necessary components would be located within a single housing.

We are persuaded, and we find, that Denison, Roatis, and Deguchi collectively teach every limitation of claim 1.

b. Whether a Person of Ordinary Skill in the Art Would Have Been Motivated to Combine Denison, Roatis, and Deguchi and Would Have Had a Reasonable Expectation of Success in Doing So

Petitioner explains in its Petition why a person of ordinary skill in the art would have been motivated to modify Denison’s system, based on the disclosures of Roatis and Deguchi, in each of the three respects explained above. *See supra* Section II.D.4.a. First, even if Denison did not disclose “wireless” communication with a programmable key (and we find that it does), it would have been obvious to modify Denison’s system to use Roatis’s cradle, which communicates wirelessly. Pet. 16, 24. Petitioner asserts that Denison and Roatis disclose similar systems and share a named

inventor, and a person of ordinary skill in the art would have been aware of the “advantages” of wireless communication, such as “the fact that with Roatis’s cradle, the electronic key does not need to be physically connected to the cradle, but instead simply needs to be ‘within communication distance.’” *Id.* (quoting Ex. 1003 ¶ 80). Second, Roatis’s cradle has a ready/wait light (and corresponding user interface on the computer), and a person of ordinary skill in the art incorporating Roatis’s cradle into Denison’s system “naturally would have also used the software for that cradle” in Denison’s system. *Id.* at 17–18, 26–27. Third, it would have been obvious to integrate the cradle functionality of the combined device into Denison’s external computing device based on Deguchi’s express teaching of the “desirab[ility]” of directly connecting to a host device to avoid the problems associated with cradles. *Id.* at 16–17, 24–25.

Patent Owner argues that a person of ordinary skill in the art would not have had reason to integrate the cradle into the computer of the combined Denison-Roatis system, as Petitioner asserts (based primarily on Deguchi), for three reasons. PO Resp. 18–23. First, Patent Owner argues that Roatis discourages doing so. *Id.* at 18–21. Patent Owner contends that Roatis stresses “the importance of the cradle’s specific hardware designed for encryption and registration functions, each [of] which provides additional layers of security for the system,” and that Roatis’s cradle “provide[s] security through a detailed software registration and authorization process.” *Id.* (citing Ex. 1003 ¶¶ 20, 70–71, claim 19). Thus, according to Patent Owner, Roatis teaches away from integration of the cradle into the computer because it “requires that the cradle exist to perform

the registration and authorization processes,” and removing the cradle would eliminate that important function. *Id.*

We disagree. We do not see anything in Roatis that indicates the registration and authorization process would be eliminated if the cradle functionality is moved to the computer to which it is connected. Rather, the portion of Roatis cited by Patent Owner describes completing a software registration process so that the software and cradle “are limited for secure operation on only one particular computer.” Ex. 1003 ¶ 70 (“The software programs [on the computer] and the cradle can properly function only after they are registered with an authorized control center.”). Integrating the cradle functionality (for communicating with a key) into the computer still would result in the functionality being used only on that particular computer. *See* Reply 13–14.

Second, Patent Owner argues that Denison and Roatis do not themselves suggest that their cradle functionality would be improved by integration into the computer and that Petitioner and Mr. Allison improperly “focus on disadvantages of the Denison/Roatis cradle” without considering “advantages of using a standalone cradle.” PO Resp. 21–23. Patent Owner points to four alleged advantages, citing testimony from Mr. Allison during cross-examination: (1) “the freedom of mobility provided by a cradle, both in connecting to multiple computers and in actual use once attached”; (2) “the cost benefit of providing a ‘ready/wait light’ on the cradle”; (3) “the portability aspect of a cradle and its ability to function with computers without required hardware or the need to ‘retrofit’”; and (4) “the benefit of encryption features provided in the hardware of the cradle.” *Id.* (citing Ex. 2002, 43:2–9, 46:11–50:2, 54:17–56:10).

“[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.” *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006). “Instead, the benefits, both lost and gained, should be weighed against one another.” *Id.* (quoting *Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000)). Based on the record presented, there appear to be advantages to cradle integration as well as advantages to using a standalone cradle. Assessing all of the evidence presented, though, we are persuaded that a person of ordinary skill in the art would have been motivated to integrate the cradle into the computer of the combined Denison-Roatis system, as Petitioner contends.

Most importantly, Deguchi discloses that various devices of the time required a cradle for communication between a portable device and host device and then expressly states that it would have been “desirable” instead to provide for a “direct connection” between a portable device and host device “for data exchange and storage without the need for an intermediary type connection such as a cradle.” Ex. 1004 ¶¶ 4–14. Both Denison and Roatis disclose communication between a host device (computer) and portable device (electronic key) for data exchange and storage. Further, all three references disclose wireless communication with a portable device. *See* Ex. 1002 ¶¶ 41, 77, 85; Ex. 1003 ¶¶ 69, 129, claim 2; Ex. 1004 ¶¶ 39–42. Thus, a person of ordinary skill in the art, having all three references available, would have understood that it would have been desirable to have a direct connection between the electronic key and computer, rather than using a cradle as an intermediary between the two.

We credit the opinion of Mr. Allison (who is the only declarant to provide testimony on issues concerning patentability in this proceeding) that a person of ordinary skill in the art would have been motivated to integrate the cradle into the computer of the combined Denison-Roatis system. *See* Ex. 1013 ¶¶ 117–120. Mr. Allison’s testimony is consistent with the references themselves. *See id.* ¶¶ 114–122. He also testified as to the known problems with cradles, which integration with the computer would avoid. *See* Ex. 2002, 33:18–34:1 (“There’s a lot of trade-offs with cradles. Any accessory adds one more thing to carry around, one more thing to break, where you might place it, those kind of things.”).

Further, we have reviewed the portions of Mr. Allison’s cross-examination cited by Patent Owner, and we do not agree with Patent Owner’s arguments as to those statements. With respect to Patent Owner’s first alleged advantage, Mr. Allison merely acknowledged that Roatis’s cradle was movable, not that any advantages from such mobility would have outweighed any advantages of cradle integration. *Id.* at 43:2–9. As to the ready/wait light, Mr. Allison stated that “the same concerns about having a cradle being separate” still would exist. *Id.* at 46:11–47:3. As to the functioning of computers without the necessary hardware or retrofitting, Mr. Allison was asked about potential advantages to the use of cradles *in general*, rather than advantages or disadvantages to such use in the combined Denison-Roatis system specifically (on which his ultimate opinions are based). *Id.* at 47:25–50:2. Finally, as to encryption features provided by the cradle hardware, Mr. Allison did not state that there would be any outweighing advantages from such functionality, *id.* at 54:17–56:10,

and, in any event, we disagree that such functionality would be eliminated in the asserted combination, for the reasons explained above.

Third, Patent Owner argues that it would have been “illogical” for a person of ordinary skill in the art to have first modified Denison’s cradle functionality (based on Roatis), then have “been so moved to discard the use of cradles altogether” (based on Deguchi). PO Resp. 8–10. We disagree. A person of ordinary skill in the art would have had all three references and considered their teachings together, not necessarily in a particular sequence. Moreover, Petitioner’s asserted combination is not based on “discard[ing]” the concept of cradles entirely. *See id.* Rather, the functionality of the cradle in the combined Denison-Roatis system simply is moved from one location (the cradle) to another (the computer). As explained herein, Petitioner has provided sufficient explanation for why a person of ordinary skill in the art would have been motivated to do so.

Having considered the parties’ arguments and the evidence of record, we find Petitioner’s assertions regarding motivation to combine persuasive, as they are supported by the references themselves and the testimony of Mr. Allison. *See* Pet. 16–18, 24–27; Ex. 1013 ¶¶ 114–122. We also agree with Mr. Allison that a person of ordinary skill in the art would have had “a high expectation of success” in making the asserted combination, given the disclosures of the references and the level of ordinary skill in the art set forth above. *See* Ex. 1013 ¶¶ 6, 114–122, 124; *supra* Section II.C.

c. Conclusion

For the reasons set forth by Petitioner and explained above, we are persuaded that Denison, Roatis, and Deguchi collectively teach all of the

limitations of claim 1 and that a person of ordinary skill in the art would have had reason to combine those teachings to achieve the apparatus of claim 1 and would have had a reasonable expectation of success in doing so. Petitioner has proven, by a preponderance of the evidence, that claim 1 would have been obvious based on Denison, Roatis, and Deguchi under 35 U.S.C. § 103(a).

5. Claim 17

Similar to claim 1, independent claim 17 recites “[i]n combination, a programmable key for operating a security device attached to an item of merchandise and a programming station,” the programming station comprising a “housing,” “logic control circuit,” and “visual display.” Claim 17 recites a “programming station” rather than an “apparatus,” and does not require that the communication with the programmable key be “wireless,” that the logic control circuit have a “controller” for generating a security code, or that the “visual display” be part of the “logic control circuit located within said housing,” as claim 1 requires. The parties argue claims 1 and 17 together, and Petitioner accounts for the different recitations in claim 17 in its analysis. *See* Pet. 28–34; PO Resp. 8–23; Reply 1–17. For reasons similar to those set forth above, we are persuaded that Denison, Roatis, and Deguchi collectively teach all of the limitations of claim 17 and that a person of ordinary skill in the art would have had reason to combine those teachings to achieve the combination of devices recited in claim 17 and would have had a reasonable expectation of success in doing so. Petitioner has proven, by a preponderance of the evidence, that claim 17 would have been obvious based on Denison, Roatis, and Deguchi under 35 U.S.C. § 103(a).

6. Claims 2, 18, and 19

Petitioner explains sufficiently how the limitations of dependent claims 2, 18, and 19 are taught or suggested by the combination of Denison, Roatis, and Deguchi, with supporting testimony from Mr. Allison. *See* Pet. 35, 40–41. Claim 2 recites that “the memory for storing the security code is a non-volatile memory enabling said memory to survive power interruptions.” Petitioner asserts, with supporting testimony from Mr. Allison, that because Denison’s external computing device is a laptop computer, which is “mobile by definition and often powered on and off,” a person of ordinary skill in the art “would have understood the need to keep access codes in permanent storage (*e.g.*, hard drive or flash memory), such that the codes are not lost on each restart.” *Id.* at 35 (citing Ex. 1013, 53). Indeed, as Petitioner points out, Denison’s external computing device has a database of access codes that were “calculated previously,” suggesting that they are maintained in non-volatile memory. *Id.* (citing Ex. 1002 ¶¶ 79, 84). Claims 18 and 19 depend from independent claim 17. Claim 18 recites that “the control circuit includes a controller for generating the security code,” and claim 19 recites that “the communication system is a wireless communication system.” These limitations are recited in claim 1, and Petitioner’s analysis is similar to that with respect to claim 1. *See id.* at 20–25, 40–41. We agree with Petitioner’s arguments for the reasons explained above. *See supra* Section II.D.4.

Patent Owner does not argue separately dependent claims 2, 18, and 19 in its Response. We have reviewed Petitioner’s contentions and supporting evidence, including the testimony of Mr. Allison, and are persuaded that Petitioner has proven, by a preponderance of the evidence,

that dependent claims 2, 18, and 19 would have been obvious based on Denison, Roatis, and Deguchi under 35 U.S.C. § 103(a), for the reasons stated by Petitioner.

7. Claims 3–6

Claim 3 depends from claim 1, and recites that “the visual display includes a plurality of LEDs.” As explained above, in Petitioner’s proposed combination, Roatis’s cradle functionality is integrated into Denison’s external computing device, and we agree with Petitioner that Roatis discloses a “visual display.” See Pet. 32–35; *supra* Section II.D.4. Petitioner provides the following colored version of Figure 1 of Roatis (Pet. 36).

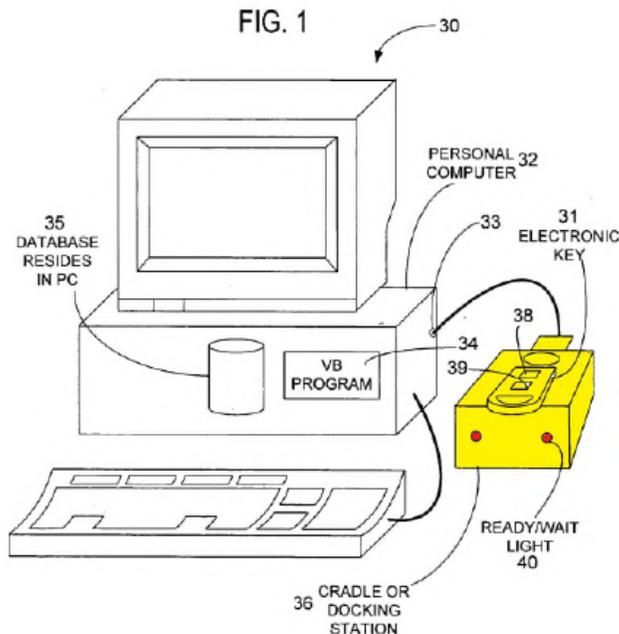


Figure 1 illustrates an embodiment of Roatis’s key management system, and the figure has been highlighted by Petitioner to bring focus to certain aspects of the illustration including the “indicator” lights. See Ex. 1003 ¶ 42; Pet. 36. As show in red in the figure above, Roatis discloses two “indicators

[on cradle 36] such as a ready/wait light 40.” Pet. 36 (quoting Ex. 1003 ¶ 69). Although Roatis calls these indicators “light[s],” the reference does not state specifically that they are LEDs. *Id.* According to Petitioner and Mr. Allison, however, using LEDs would have been obvious because (1) Roatis discloses the use of an LED as an “indicator light[]” in a slightly different context, i.e., the electronic key that communicates with the cradle; (2) Denison also discloses the use of an LED in its electronic key and vending machine; (3) Denison discloses the use of a laptop computer as the external computing device, and laptop computers were known to include LEDs as “indicator lights that indicate whether the laptop is powered, the status of the hard drive and Wi-Fi, etc.”; and (4) LEDs were known to have “lower energy usage and heat output and longer lifespan than other light sources.” *Id.* at 36–37 (citing Ex. 1002 ¶¶ 37–38; Ex. 1003 ¶¶ 69, 80; Ex. 1013, 53–55).

Petitioner makes similar arguments and cites similar testimony from Mr. Allison for claims 4–6, which recite particular features of the LEDs of claim 3. Claim 4 depends from claim 3, and recites that “a first of said LEDs is activated when power to the station⁹ is ON.” Petitioner contends that Denison discloses the use of a laptop computer as the external computing device and laptop computers were known to include LEDs as indicator lights, such that a person of ordinary skill in the art would have found it obvious to “include an indicator light in the form of an LED that indicates whether the laptop is powered.” *Id.* at 37 (citing Ex. 1013, 55).

⁹ We interpret “the station” in claim 4 to refer to the “apparatus” of parent claim 1. *See* Pet. 37.

Claim 5 depends from claim 4, and recites that “a second of said LEDs flashes for a period of time when wireless communication is started with the programmable key.” Petitioner notes Roatis’s disclosure that its “cradle light stays ‘RED’ when it is communicating with the key.” *Id.* (quoting Ex. 1003 ¶ 80). Although Roatis’s light stays lit when communicating, rather than flashing for a period of time, Petitioner argues that performing the latter would have been obvious because (1) Roatis discloses an “indicator” LED flashing a certain number of times in a slightly different context, i.e., the electronic key that communicates with the cradle; and (2) “[l]ights commonly flash on computers indicating communication is occurring,” so a person of ordinary skill in the art “would have found it obvious and desirable to incorporate this functionality into the indicator light for usability purposes.” *Id.* at 37–38 (citing Ex. 1003 ¶ 108; Ex. 1013, 55–56).

Finally, claim 6 depends from claim 5, and recites that “a third of said LEDs is activated when a programming failure occurs.” Again, Denison discloses the use of a laptop computer and Roatis discloses a cradle with indicator lights. Petitioner argues that it was “extremely common to indicate errors in computing devices through LED lights, *e.g.*, flashing in certain patterns or green for success and red for failure,” such that, “[t]o the extent a programming failure occurs, a [person of ordinary skill in the art] would have found it advantageous to indicate such to the user.” *Id.* at 38 (citing Ex. 1013, 56).

Patent Owner argues that Petitioner’s contentions regarding claims 4–6 are conclusory and fail to explain why a person of ordinary skill in the art would have incorporated the specific LED features into the combined

device of Petitioner’s asserted combination. PO Resp. 26–27. We disagree. Petitioner’s arguments are supported by the testimony of Mr. Allison and the references themselves. *See* Pet. 35–38. Mr. Allison does not state unsupported opinions but, rather, cites Denison and Roatis numerous times in his analysis, explaining how each of the recited LED features would have been an obvious extension of what the references already disclose and why a person of ordinary skill in the art would have been motivated to include the features. *See* Ex. 1013, 53–56. For example, for claim 3, Mr. Allison opines that using LEDs as the indicator lights in Roatis would have been beneficial because LEDs were known to use less energy, output less heat, and last longer than other types of light sources. *Id.* at 54. Likewise, for claim 5, he opines that flashing an LED to inform the user that communication is taking place would have been desirable to improve the “usability” of the device. *Id.* at 56. Patent Owner provides no declarant testimony to the contrary. Mr. Allison’s testimony on these points is unrebutted, and, more importantly, we find that it is consistent with the disclosures of Denison and Roatis, as explained above. Weighing Petitioner’s arguments and Mr. Allison’s supporting testimony, and Patent Owner’s attorney argument to the contrary, we are persuaded that a person of ordinary skill in the art would have found it obvious to implement the LED features recited in claims 3–6. *See Idemitsu Kosan Co., Ltd. v. SFC Co. Ltd.*, 870 F.3d 1376, 1381 (Fed. Cir. 2017) (“[The petitioner] bears the ultimate burden of establishing unpatentability, but it is not required as a matter of law to rebut mere attorney argument with expert testimony in order to satisfy that burden.” (emphases omitted)).

For the reasons stated by Petitioner, we are persuaded, by a preponderance of the evidence, that claims 3–6 would have been obvious based on Denison, Roatis, and Deguchi under 35 U.S.C. § 103(a).

8. Claim 7

Claim 7 depends from claim 1, and recites that “the housing has an internal chamber” and “the logic control circuit is a printed circuit board located within the housing chamber.” Relying on the supporting testimony of Mr. Allison, Petitioner argues that, although Denison does not disclose explicitly a printed circuit board, the reference does disclose the use of a laptop computer as the external computing device. Pet. 38 (citing Ex. 1013, 56–57). Petitioner refers to its previous analysis explaining that a person of ordinary skill in the art would have understood that a laptop computer includes certain components, such as a microprocessor and memory, “located within the casing (*i.e.*, housing)” of the laptop computer. *Id.* at 19–20, 38. Petitioner asserts that a person of ordinary skill in the art also would have understood that such computing components would have been located on printed circuit boards within the casing of the laptop computer. *Id.* at 38.

Patent Owner argues in its Response that Petitioner fails to “provide any articulated reasoning why someone would take the far-flung computer components of Denison and Roatis and place them all on a single printed circuit board in the same housing.” PO Resp. 24–25. As explained above, however, we agree with Petitioner that it would have been obvious, based primarily on Deguchi, to incorporate all of the recited components of the logic control circuit, including the “visual display,” in a single housing. *See*

supra Section II.D.4. Patent Owner further argues that it would be illogical to do so because “if the ‘visual display’ of either Denison or Roatis were placed inside the computer housing of those disclosures and on a printed circuit board,^[10] the functionality of such components would be obliterated.” PO Resp. 25. We disagree. Roatis discloses key indicator lights that are positioned on the outside of the cradle structure, similar to LEDs 23 extending through housing shell 11 in the ’844 patent. *See* Pet. 25–27; Reply 16; *compare* Ex. 1003, Fig. 1, *with* Ex. 1001, Fig. 3. We see no reason why the key indicator lights would not be positioned similarly in the combined device of Petitioner’s asserted combination.

¹⁰ Although not entirely clear from the Response, it appears that Patent Owner may be reading claim 7 as requiring the logic control circuit to be only the printed circuit board itself, or that the logic control circuit components be mounted directly “on” the printed circuit board. Both readings are inconsistent with the claim language, however, as Petitioner points out. *See* Reply 23–25. Parent claim 1 recites that the logic control circuit “includ[es]” four recited components. We interpret “logic control circuit located within said housing” to mean a collection of computer components that are connected through a circuit and located within a single housing. *See supra* Section II.A. Claim 7 in turn recites that the logic control circuit “is” a “printed circuit board.” Thus, the printed circuit board also must, by definition, include at least the four components and provide a circuit through which the components are connected. Also, requiring direct mounting on the printed circuit board would read out the only embodiment described in the Specification of the ’844 patent. *See* Reply 24–25; Ex. 1001, col. 3, ll. 59–62 (disclosing that LEDs 23 are not mounted directly on printed circuit board 5, but rather “mounted on spacer 9 and electrically connected to circuit board 5 by conductors 24”), Fig. 3; *In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1324 (Fed.Cir.2011) (“[T]here is a strong presumption against a claim construction that excludes a disclosed embodiment.”).

We are persuaded that Petitioner has made a sufficient showing as to claim 7. In particular, we agree with Petitioner that Denison discloses a laptop computer with an outer “housing” and a corresponding “internal chamber” (containing the parts of the computer). *See* Pet. 19–20. Petitioner points to Figure 17, shown above, which clearly depicts external computing device 426 having the three-dimensional structure of a typical laptop computer. *See id.* As to the “printed circuit board” limitation, similar to claims 3–6 addressed above, we are persuaded under the circumstances that Denison’s description of a laptop computer and Mr. Allison’s testimony about what a person of ordinary skill in the art would have understood from that disclosure are sufficient to meet Petitioner’s burden. *See* Tr. 36:2–23 (Patent Owner acknowledging that Mr. Allison’s testimony as to claim 7 is un rebutted).

For the reasons stated by Petitioner, we are persuaded, by a preponderance of the evidence, that claim 7 would have been obvious based on Denison, Roatis, and Deguchi under 35 U.S.C. § 103(a).

9. Claim 12

Claim 12 depends from claim 1, and recites “a mechanical key activated ON/OFF switch mounted in the housing and operatively connected to the logic control circuit.” Again relying on the testimony of Mr. Allison, Petitioner argues that Denison discloses a laptop computer as the external computing device, and that a person of ordinary skill in the art “would have understood that laptop computers include an ‘ON/OFF’ button, *i.e.*, the button is mounted in the housing of the laptop and operatively connected to the microprocessor and other components of the logic control circuit.” Pet.

38–39 (citing Ex. 1013, 57). Further, according to Petitioner and Mr. Allison, a person of ordinary skill in the art would have “understood and found obvious that such ‘ON/OFF’ buttons are typically mechanical keys that can be physically pressed to turn the power on and off.” *Id.*

Patent Owner argues that Petitioner’s arguments “fail[] to account for the specific recitations of the claim[.]” PO Resp. 31–32. We agree with Patent Owner. Claim 12 requires an “ON/OFF switch” that is “mounted in the housing and operatively connected to the logic control circuit” and further requires that the switch is configured to be “activated” by a “mechanical key.”¹¹ Petitioner and Mr. Allison appear to rely on a general “‘ON/OFF’ button” of a typical laptop computer as *both* the recited “switch” itself and the recited “mechanical key.” *See* Pet. 38–39; Ex. 1013, 57. Petitioner does not explain what particular physical structure in the housing of a laptop computer would constitute the “switch,” how that structure would be activated by a different structure that can be considered a “mechanical key,” or how the alleged switch would be “operatively connected to the logic control circuit.” Although we agree that laptop computers of the type described in Denison typically would have included a

¹¹ The exemplary embodiment described in the Specification of the ’844 patent includes key controlled power on/off switch 35, which is “mounted in a complementary-shaped opening 37” of spacer 9, “electrically coupled to printed circuit board 5,” and activated by specially configured key 38. Ex. 1001, col. 4, ll. 14–21, Figs. 1, 3, 3A, 4, 5, 8. “The exposed top part of key switch 35 is formed with a key receiving opening 43 requiring a specially configured key 38 (FIG. 8) to be used for turning the programming station on and off in order to program a smart key 40 with a security disarm code (SDC)” *Id.* at col. 4, ll. 17–21. Specially configured key 38 is mechanical, whereas key 40 is a programmable “smart key.” *Id.* at col. 4, ll. 17–26, col. 4, l. 50–col. 5, l. 41, Fig. 8.

“button” to allow the user to turn the device on and off, we determine that more explanation is necessary for Petitioner to meet its burden, given the specific language recited in claim 12.

Petitioner has not proven, by a preponderance of the evidence, that claim 12 would have been obvious based on Denison, Roatis, and Deguchi under 35 U.S.C. § 103(a).

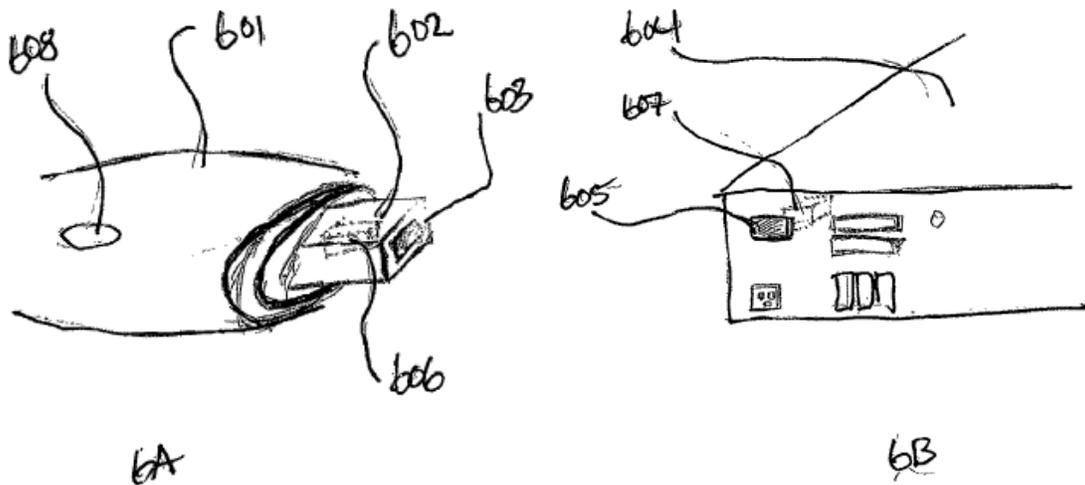
10. Claim 13

Claim 13 depends from claim 1, and recites “a key port formed in the housing for receiving the programmable key therein, said port being proximate the wireless communication system of the control logic circuit.” For this limitation, Petitioner relies *solely* on Deguchi, arguing that

Deguchi discloses an “infrared communication interface port 605” (*i.e.*, key port), which is proximate to the “infrared transmitter and receiver (transceiver) 607” (*i.e.*, wireless communication system), as depicted in [Figure 6B]. As explained for Claim 1, a [person of ordinary skill in the art] would have found it obvious to integrate Roatis’s cradle with Deguchi’s teachings including for IrDA into Denison’s external computing device.”

Pet. 39 (citing Ex. 1004 ¶¶ 39–42; Ex. 1013, 57–58); Tr. 51:18–52:9 (arguing that “we are relying upon [the] Deguchi reference for disclosing this limitation”). Patent Owner responds that Deguchi’s infrared communication interface port 605 is not a “key port formed in [a] housing for receiving [a] programmable key therein.” PO Resp. 27–31. We agree with Patent Owner.

Figures 6A and 6B of Deguchi are reproduced below.



The figures above depict portable device 6A with communication port 602 having infrared data transfer interface port 603 and infrared transmitter and receiver (transceiver) 606 “for performing data and information exchange modulated onto [the] infrared spectrum,” and host device 6B with infrared communication interface port 605 and infrared transmitter and receiver (transceiver) 607 “to enable data transmission and reception via infrared communication interface port 605.” Ex. 1004 ¶¶ 39–40. Importantly, there is no indentation or other structure on the front surface of housing 604 of host device 6B that would suggest a “key port” for “receiving” a “programmable key.” Rather, both infrared data transfer interface port 603 and infrared communication interface port 605 are shown with flat front surfaces (as indicated by the diagonal hatching lines on each), suggesting that they only need to be aligned with each other for infrared communication to occur. This is consistent with the disclosure of Deguchi, which states that “the user may *align* infrared data transfer interface port 603 of portable device 6A with infrared communication interface port 605” to perform wireless data transfer. *Id.* ¶ 41 (emphasis added). Deguchi does not state

that infrared data transfer interface port 603 should be “inserted” into or otherwise “receiv[ed]” by infrared communication interface port 605, just that the two must be “align[ed].”

Petitioner asserts in its Reply, and argued at the oral hearing, that Deguchi discloses “male” and “female” connectors, citing Figures 3–6 of Deguchi. *See* Reply 17–21; Tr. 17:5–23. Mr. Allison does not offer any testimony on that point.¹² *See* Ex. 1013, 57–58. Regardless, though, we are not persuaded. Figures 6A and 6B shown above depict interface ports with flat front surfaces that need only be aligned with each other to perform wireless communication. There is no indication in the figures, or disclosure in the written description of Deguchi, that infrared data transfer interface port 603 is a “male” connector inserted into “female” infrared communication interface port 605. Indeed, Petitioner acknowledges that infrared communication does not require a physical connection. *See* Reply 21; Tr. 49:19–22. Certainly, Figures 3–5 of Deguchi appear to depict such “male” and “female” connections, but those figures depict *wired* connections, not a *wireless* connection as required by claim 13. *See* Ex. 1004 ¶¶ 26–38 (describing Universal Serial Bus (USB), IEEE 1394, and Personal Computer Memory Card International Association (PCMCIA) interfaces), claims 2, 23, 24 (distinguishing those “physical communication connection[s]” from “wireless communication connection[s]” like infrared),

¹² Mr. Allison only opines that infrared communication interface port 605 of host device 6B is a “key port formed in [a] housing for receiving [a] programmable key therein,” as recited in claim 13. Ex. 1013, 57–58. Unlike other claims addressed herein, such as claims 3–7, Mr. Allison’s testimony regarding claim 13 is not supported by—and in fact is inconsistent with—the relied upon reference itself.

Figs. 3–5. Finally, Petitioner asserts in its Reply that “it was well known and obvious to use a physical port with infrared, . . . as commonly used with fiber optic cables, which transmit light in the infrared spectrum.” Reply 21. Petitioner, however, does not expound on that point or cite any support, such as testimony from Mr. Allison. In addition, Deguchi’s devices, on which Petitioner relies for the asserted obviousness combination, are not shaped like a fiber optic cable or corresponding fiber optic cable receiver.

Petitioner has not proven, by a preponderance of the evidence, that claim 13 would have been obvious based on Denison, Roatis, and Deguchi under 35 U.S.C. § 103(a).

*E. Obviousness Ground Based on Denison, Timblin, Roatis, and Deguchi
(Claim 14)*

Claim 14 depends from claim 1, and recites that “the security code is a code for disarming the security device.” Petitioner argues that claim 14 is unpatentable over Denison, Timblin,¹³ Roatis, and Deguchi, relying on Timblin for the additional limitation recited in claim 14. Pet. 60–63. Specifically, Petitioner acknowledges that Denison does not include an alarm system that can be disarmed but argues that a person of ordinary skill in the art would have been motivated to modify Denison’s system to use an alarm system as taught by Timblin, referring to Petitioner’s previous analysis of the combined teachings of Denison and Timblin for claim 15. *Id.* at 43–44, 49–52, 60. For example, Petitioner contends that a person of ordinary skill in the art “would have been motivated to add the alarm

¹³ Timblin was not of record during prosecution of the ’844 patent. *See* Ex. 1001, (56); Pet. 3.

[system] of Timblin” to Denison’s system “in order to prevent and deter theft.” *Id.* at 44. According to Petitioner, by modifying Denison’s system in that manner, the alarm would be “disarmed when the door of the vending machine is properly unlocked and opened via the ‘access code’ (*i.e.*, security code) of the ‘electronic key.’” *Id.* at 60.

Petitioner’s analysis, supported by the testimony of Mr. Allison, which we credit, is persuasive. *See id.* at 60–63; Ex. 1013 ¶¶ 137–138, 177–184. Patent Owner does not argue separately dependent claim 14 in its Response. We have reviewed Petitioner’s contentions and supporting evidence, including the testimony of Mr. Allison, and are persuaded that Denison, Timblin, Roatis, and Deguchi collectively teach all of the limitations of claim 14 and that a person of ordinary skill in the art would have had reason to combine those teachings to achieve the apparatus of claim 14 and would have had a reasonable expectation of success in doing so. Petitioner has proven, by a preponderance of the evidence, that claim 14 would have been obvious based on Denison, Timblin, Roatis, and Deguchi under 35 U.S.C. § 103(a), for the reasons stated by Petitioner.

III. ORDER

Petitioner has demonstrated, by a preponderance of the evidence, that claims 1–7 and 17–19 are unpatentable over Denison, Roatis, and Deguchi, and that claim 14 is unpatentable over Denison, Timblin, Roatis, and Deguchi, under 35 U.S.C. § 103(a). Petitioner has not demonstrated, by a preponderance of the evidence, that claims 12 and 13 are unpatentable over Denison, Roatis, and Deguchi under 35 U.S.C. § 103(a).

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In consideration of the foregoing, it is hereby:

ORDERED that claims 1–7, 14, and 17–19 of the '844 patent have been shown to be unpatentable; and

FURTHER ORDERED that claims 12 and 13 of the '844 patent have not 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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