

**United States Court of Appeals  
for the Federal Circuit**

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**ROKU, INC.,**  
*Appellant*

v.

**UNIVERSAL ELECTRONICS, INC.,**  
*Appellee*

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2022-1058

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Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. IPR2019-01615.

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Decided: March 31, 2023

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WILLIAM MILLIKEN, Sterne Kessler Goldstein & Fox, PLLC, Washington, DC, argued for appellant. Also represented by JON WRIGHT; JONATHAN DANIEL BAKER, Dickinson Wright PLLC, Mountain View, CA; MICHAEL DAVID SAUNDERS, Austin, TX.

MICHAEL ANTHONY NICODEMA, Greenberg Traurig LLP, West Palm Beach, FL, argued for appellee. Also represented by BENJAMIN GILFORD, JAMES J. LUKAS, JR., Chicago, IL.

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Before NEWMAN, REYNA, and STOLL, *Circuit Judges*.

Opinion for the court filed by *Circuit Judge STOLL*.

Dissenting opinion filed by *Circuit Judge NEWMAN*.

STOLL, *Circuit Judge*.

Roku, Inc. appeals the Patent Trial and Appeal Board’s final written decision holding that claims 1, 3, 5, and 7 of U.S. Patent No. 9,716,853 had not been proven unpatentable as obvious. This case turns on a single question—whether a person of ordinary skill in the art would have understood the prior art’s disclosure of a listing of remote command codes formatted for transmission via two different communication methods to be a listing comprised of at least a first communication method and a second communication method different than the first communication method. Because the question presented involved the scope and content of the prior art, the Board resolved this dispute as a purely factual question, which we review for substantial evidence. The Board thoroughly considered the evidence of record and found in its final written decision that the skilled artisan would not have understood the prior patent’s listing of remote command codes to correspond to the claim limitation at issue. Because the Board’s finding in this close factual dispute is supported by substantial evidence, we affirm the Board’s final written decision.

#### BACKGROUND

The ’853 patent relates to universal remotes and, more specifically, to a universal control engine (UCE) that facilitates communication between a controlling device (i.e., a remote) and intended target appliances (e.g., a TV, a DVD player, a sound system, etc.). ’853 patent col. 1 l. 63–col. 2 l. 45. Although the specification of the ’853 patent acknowledges that universal remotes were known at the time of the invention, it states that the proliferation of new communication methods raises the potential for “confusion,

misoperation, or other problems,” *id.* at col. 1 ll. 40–59, particularly because the preferred communication method for transmitting commands “may vary by both appliance and by the function to be performed,” *id.* at col. 6 ll. 62–64. For example, a user can “power on and select inputs on a TV” using Consumer Electronic Control (CEC) commands while “control[ing] the volume on the same TV” using infrared (IR) commands. *Id.* at col. 2 ll. 21–45. The ’853 patent’s purported invention is the ability to reliably use different communication methods that enable a single remote control to provide commands to a variety of target appliances, according to the optimal method of communication for each target appliance and command. *Id.* at col. 2 ll. 16–20.

The ’853 patent’s UCE can “receive commands from a controlling device” and “apply the optimum methodology to propagate the command function(s) to each intended target appliance,” *id.* at col. 2 ll. 20–37, according to a “preferred command matrix,” *id.* at col. 7 ll. 19–29. The preferred command matrix, an example of which is shown below, can be, for example, a list or a table with entries that correspond to a specific command and “comprise identification of [(1)] a form of command/transmission to be used and [(2)] a pointer to the required data value and formatting information for the specific command.” *Id.* at col. 7 ll. 19–29.

Function	Appliance					
	TV	AVR	STB/DVR	DVD	CD	Etc....
Power on	CEC	CEC	CEC	CEC	IR	
Power off	CEC	CEC	CEC	CEC	IR	
Volume up	IR	CEC	n/a	n/a	n/a	
Volume down	IR	CEC	n/a	n/a	n/a	
Mute	IR	CEC	n/a	n/a	n/a	
Play	n/a	n/a	CEC	CEC	IR	
Pause	n/a	n/a	CEC	CEC	IR	
FF	n/a	n/a	CEC	CEC	IR	
Rew	n/a	n/a	CEC	CEC	IR	
Sound field A	CEC	IP	IP	n/a	n/a	
Sound field B	CEC	IP	IP	n/a	n/a	
Input 1	CEC	IR	n/a	n/a	n/a	
Input 2	CEC	IR	n/a	n/a	n/a	
Etc....						

Figure 7

'853 patent Fig. 7.

Representative claim 1 recites:

1. A universal control engine, comprising:

a processing device; and

a memory device having stored thereon instructions executable by the processing device, the instructions, when executed by the processing device, causing the universal control engine

to respond to a detected presence of an intended target appliance within a logical topography of controllable appliances which includes the universal control engine by

using an identity associated with the intended target appliance to create *a listing comprised of at least a first communication method and a second*

*communication method different than the first communication method* for use in controlling each of at least a first functional operation and a second functional operation of the intended target appliance and

to respond to a received request from a controlling device intended to cause the intended target appliance to perform a one of the first and second functional operations by

causing a one of the first and second communication methods in the listing of communication methods that has been associated with the requested one of the first and second functional operations to be used to transmit to the intended target appliance a command for controlling the requested one of the first and second functional operations of the intended target appliance.

*Id.* at col. 14 l. 41–col. 15 l. 7 (emphasis added to key limitation).

Roku filed a petition for *inter partes* review of claims 1, 3, 5, and 7 of the '853 patent, asserting that the challenged claims would have been obvious in view of U.S. Patent Pub. No. 2012/0249890 (“Chardon”) and other asserted prior art references. Disposition of the case before us rests, as it did before the Board, on a single, narrow issue: whether Chardon discloses “a listing comprised of at least a first communication method and a second communication method different than the first communication method” as recited in each challenged claim.

Like the patent-in-suit, Chardon describes a remote control system configured to control various target devices (e.g., TVs, DVD players, stereo equipment, etc.). Chardon uses target device identification data to generate a linked database (e.g., a linked list) including sets of command codes (i.e., instructions to perform a command) associated

with specific communication protocols. Chardon, ¶¶ [0006]–[0008]. This linked database includes at least two different sets of command codes—specifically, a set of CEC command codes and a set of IR command codes. Chardon’s system receives a command to perform a specific action (i.e., volume up) on a target appliance (i.e., a TV) and first relays the command to the TV using a CEC command code. *Id.* at ¶ [0058]. If the system doesn’t receive a response from the TV indicating receipt of the command, the system then “determine[s] an IR command code . . . to perform the same set of functions as the CEC command code” and transmits that IR command code to the TV. *Id.* Alternatively, the system can determine in advance that a target device “is not configured to receive CEC command codes” and “send IR command codes . . . instead.” *Id.* at ¶ [0058]; *see also id.* at ¶ [0068].

Roku argued that Chardon disclosed the disputed claim limitation to a skilled artisan, devoting much of its petition to explaining how Chardon “creates a database of IR and CEC command codes.” J.A. 116. In other words, Roku established in its petition that Chardon describes a process for creating a database of command codes, at least some of which are formatted for transmission according to a first communication method and some of which are formatted for transmission according to a second communication method. “In this way,” Roku asserted, without further explanation, “Chardon meets the claimed limitation” of a listing of “at least a first (e.g., CEC) and second (e.g., IR) communication method.” *Id.*

Roku’s petition did not explain how a list of command codes is a list of communication methods. Nor did it suggest that Chardon’s list of command codes would render the claimed list of communication methods obvious. For example, it did not state that Chardon’s list of command codes is inherently a list of communication methods, or explain that a skilled artisan would have been motivated to derive a list of communication methods from the command

codes, or provide evidence that a skilled artisan would have known that Chardon's list of command codes was also a list of communication methods. In its petition, Roku thus assumed that, because Chardon's command codes are formatted for transmission via different communication methods, its list of command codes is necessarily a list of communication methods. But Roku neither articulated this assumption nor explained how the record evidence supported it.

Further, Roku advanced no claim constructions for the disputed limitation, asserting instead that the relevant claim language "should simply receive [its] plain and ordinary meaning, as informed by the '853 patent specification." J.A. 83.

To support its assertions, Roku's petition did rely on the expert testimony of Dr. Samuel Russ. Dr. Russ explained that Chardon's linked database discloses "a listing comprised of at least a first communication method (e.g., CEC command codes) and a second communication method (e.g., IR command codes)." J.A. 905 (Russ Decl. ¶ 203). This testimony seemingly equates CEC command *codes* with a first communication *method* and IR command *codes* with a second communication *method*. Dr. Russ later elaborated, however, that Chardon used its linked database "to send a CEC command code over HDMI to an HDMI appliance using a first communication method (i.e., HDMI-CEC over a HDMI cable)," seemingly acknowledging a distinction between command codes and the communication methods over which the command codes are transmitted. J.A. 906 (Russ Decl. ¶ 205). Dr. Russ did not testify that a skilled artisan would have understood Chardon's linked database of command codes to teach or suggest a list of communication methods.

Universal did not dispute that Chardon discloses a process for creating a listing of CEC command codes and IR command codes. Universal asserted instead that Roku had failed to establish that this disclosure teaches or renders

obvious creating a listing of two different communication methods. J.A. 300–02. Universal rebutted Roku’s positions and Dr. Russ’s testimony with that of Dr. Don Turnbull. Dr. Turnbull opined that one of ordinary skill in the art would “not have understood a ‘command code’ to be a ‘communication method.’” J.A. 3034 (Turnbull Decl. ¶¶ 69–70). He explained that a command code is “an instruction to perform a function,” whereas a communication method is “a medium or protocol for transmitting or receiving information.” *Id.* Dr. Turnbull explained that the ’853 patent specification itself “expressly distinguishes between a listing of communication methods and a database of command codes.” J.A. 3034–35 (Turnbull Decl. ¶ 71). As support, Dr. Turnbull cited Figure 7 of the ’853 patent, which shows a matrix with cells comprising “identification of a form of command/transmission to be used,” such as CEC and IR. *Id.* He explained that the matrix “expressly distinguishes between command codes and the communication methods (e.g., CEC and IR) that are used to communicate the command codes.” J.A. 3035 (Turnbull Decl. ¶ 72) (citing ’853 patent col. 7 ll. 30–42). Dr. Turnbull emphasized that the ’853 patent clearly differentiates between the “form of command/transmission to be used” and the data value and formatting information for the specific command, which is “stored elsewhere” in memory. J.A. 3034–35 (Turnbull Decl. ¶¶ 71–72); *see also* ’853 patent col. 7 ll. 26–29. Thus, he explained, the ’853 patent makes “clear that a listing of communication methods is not the same thing as a database of command codes.” *Id.*

In its final written decision, the Board determined that Roku had not shown that the challenged claims would have been obvious. The Board explained that although Roku “specifically equate[d] ‘a first communication method’ with ‘CEC command codes’ and ‘a second communication method different from the first communication method’ with ‘IR command codes,’” J.A. 20 (citing J.A. 119–20, 126–27), it failed to show that one of ordinary skill would



have understood that these were the same things. The Board emphasized that Roku cited “no analysis or expert testimony” to show that Chardon’s linked database of command codes and the transmission of those command codes over two different communication methods taught or suggested “the claimed listing that is comprised of at least two different communication methods.” J.A. 22. Acknowledging that there was “no requirement that literal names of different command transmission mediums . . . appear in the text of the listing,” the Board nevertheless found that the record fell “short of providing evidence that one of ordinary skill in the art would have understood stored command codes” to identify communication methods rather than act as a “reference for codes to be used once the communication method to be used is determined in some other way.” *Id.* (cleaned up). Thus, the Board concluded that Roku had not shown by a preponderance of the evidence that the challenged claims would have been obvious over Chardon alone, or in combination with other cited prior art references.

Roku requested rehearing, alleging among other things that the Board “erred by implicitly construing,” J.A. 525, the term “communication method” as “the ‘method of transmission’ or the ‘transmission medium’ through which the selected command is sent,” J.A. 528. The Board denied Roku’s petition, explaining that it did not so construe the claims. J.A. 29. Furthermore, the Board explained that, even if it had construed the claim term as averred by Roku, “the outcome . . . would have been no different.” *Id.* Specifically, the Board emphasized that the question of “whether a command code teaches a communication method” presents a factual question that the Board had already considered and “decided in favor of Patent Owner” Universal, and Roku’s attempt to characterize the Board’s analysis as including an implicit construction was both incorrect and unpersuasive. J.A. 31.

Roku appeals. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

#### DISCUSSION

The ultimate question of obviousness is a legal question that we review de novo with underlying factual findings that we review for substantial evidence. *Fleming v. Cirrus Design Corp.*, 28 F.4th 1214, 1221 (Fed. Cir. 2022). Those underlying findings of fact, as enumerated by the Supreme Court nearly six decades ago, include the *Graham* factors—“basic factual inquiries,” the answers to which provide a foundation for the ultimate determination of obviousness or nonobviousness. *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17–18 (1966). The *Graham* factors include: “(1) the scope and content of the prior art, (2) differences between the prior art and the claims at issue, (3) the level of ordinary skill in the pertinent art, and (4) the presence of objective indicia of nonobviousness such as commercial success, long felt but unsolved needs, failure of others, and unexpected results.” *Elbit Sys. of Am., LLC v. Thales Visionix, Inc.*, 881 F.3d 1354 (Fed. Cir. 2018) (internal quotation marks omitted) (citing *Graham*, 383 U.S. at 17–18). Substantial evidence is evidence such that a “reasonable fact finder could have arrived at the agency’s decision.” *OSI Pharms., LLC v. Apotex Inc.*, 939 F.3d 1375, 1381 (Fed. Cir. 2019) (quoting *In re Gartside*, 203 F.3d 1305, 1312 (Fed. Cir. 2000)). “[T]he possibility of drawing two inconsistent conclusions from the evidence does not prevent an administrative agency’s finding from being supported by substantial evidence.” *Consolo v. Fed. Mar. Comm’n*, 383 U.S. 607, 620 (1966).

As explained above, the question considered by the Board and raised on appeal is whether Chardon’s list of command codes formatted to be transmitted via different communication methods is, itself, a list of different

communication methods as recited in the claims. We can see both sides of this factual dispute.<sup>1</sup>

On one hand, before this court, Roku advances the reasonable argument that because (1) CEC and IR are communication protocols—which neither party disputes qualify as communication methods—and (2) Chardon discloses “a *protocol-specific* list of CEC command codes” and “a *protocol-specific* list of IR command codes,” Chardon necessarily discloses creating a listing comprised of at least two different communication methods “as a matter of logic.” Appellant’s Br. 24–27. Although Roku does not dispute that a “command code” is not the same as a “communication method,” it argues that Chardon’s protocol-specific “listing unambiguously indicates both the command code and the communication protocol (i.e., communication method) to be used in transmission.” *Id.* at 28–29.

On the other hand, as Universal persuasively argues, Roku has failed to show that the Board’s fact finding—that Chardon’s command code formatted for transmission via a particular communication method was not proven to be a communication method—was unsupported by substantial evidence. Appellee’s Br. 23. First, Universal notes that Roku’s argument contradicts the disclosure of the ’853 patent itself. *Id.* at 24. For example, the ’853 patent describes its listing as a “command matrix,” comprising “a series of data cells” that include “identification of a form of command/transmission to be used” and “a pointer to the

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<sup>1</sup> The dissent asserts that we should apply *de novo* review to this issue. But Roku expressly raises only a factual question on appeal: whether Chardon teaches a particular claim element. *See* Appellant’s Br. 21 (“That factual issue is the sole subject of this appeal.”). We thus view the issue on appeal as a *Graham* factor underlying obviousness—not as a question of the ultimate conclusion of obviousness.

required data value and formatting information for the specific command,” which is stored in a separate location in memory. ’853 patent col. 7 ll. 19–29. In other words, the patent specification itself distinguishes a list of communication methods from a separate list of command codes. Second, Universal argues that the Board’s decision is supported by Dr. Turnbull’s expert testimony. Appellee’s Br. 25–26. According to Universal, the Board was entitled to weigh Dr. Turnbull’s testimony that a skilled artisan “would not have understood a ‘command code’ to be a communication method,” J.A. 3034 (Turnbull Decl. ¶¶ 69–70), more heavily than Dr. Russ’s more vague and unexplained testimony that Chardon’s linked database discloses “a listing of at least a first communication method (e.g., CEC command codes) and a second communication method (e.g., IR command codes),” J.A. 905 (Russ Decl. ¶ 203). Finally, Universal points out that Roku does not dispute the basic fact that a command code is different than a communication method.

Review of the record as a whole reveals that the factual dispute at hand was highly contested and closely decided. Most significantly for our purposes, the Board’s finding was supported by substantial evidence. Specifically, the Board’s finding flows from the ’853 patent specification itself and Dr. Turnbull’s testimony. This evidence supported the Board’s finding that Roku had failed to meet its burden of proof. The Board, in its role as factfinder in the first instance, was entitled to weigh the evidence in the record, including this evidence against Roku.

An appellate court “do[es] not and should not reweigh evidence or make factual findings.” *Impax Lab’ys, Inc. v. Lannett Holdings Inc.*, 893 F.3d 1372, 1382 (Fed. Cir. 2018). As an appellate court, our role is to review the Board’s findings for substantial evidence, not to step into its place and make those findings anew. *Id.* Indeed, although this court could well have decided the factual dispute at hand differently than the Board did, it is not the

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province of this court to do so. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 327 (2015) (explaining that a lower tribunal, which has “presided over, and listened to, the entirety of a proceeding has a comparatively greater opportunity to gain that familiarity than an appeals court judge who must read a written transcript or perhaps just those portions to which the parties have referred”).

Because the Board’s factual finding—that Chardon’s listing of command codes did not teach or suggest a listing of communication methods—was supported by substantial evidence, we affirm the Board’s decision that Roku has not shown that the challenged claims would have been obvious.

#### CONCLUSION

We have considered the parties’ remaining arguments and find them unpersuasive. For the foregoing reasons, we affirm the Board’s final written decision.

**AFFIRMED**

**United States Court of Appeals  
for the Federal Circuit**

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**ROKU, INC.,**  
*Appellant*

v.

**UNIVERSAL ELECTRONICS, INC.,**  
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2022-1058

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NEWMAN, *Circuit Judge*, dissenting.

I respectfully dissent, for I have concerns as to both procedural and substantive aspects of the court's ruling.

I

With respect to procedure, the court holds that because the parties did not dispute claim construction at the Patent Trial and Appeal Board ("PTAB" or "Board"), our appellate review is limited to whether substantial evidence supports the PTAB's decision of non-obviousness. Claim construction and obviousness are questions of law, whose underlying factual components may or may not be disputed. When disputed, factual findings of the PTAB are reviewed for support by substantial evidence, as the panel majority

recognizes, *see Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (reciting the standard of review for PTAB findings of fact), whereas the ultimate questions of law remain for de novo determination on appeal, *id.*

The panel majority states that because “the question presented involved the scope and content of the prior art, the Board resolved this dispute as a purely factual question, which we review for substantial evidence.” Maj. Op. at 2. The majority then finds that substantial evidence supports the PTAB’s finding that “Chardon’s listing of command codes did not teach or suggest a listing of communication methods.” *Id.* at 13. This is the focus of my dissent, for the majority declines to review the ultimate legal question of validity of U.S. Patent No. 9,716,853 (the “853 patent”) and instead reviews solely the Board’s specific fact-finding discussed therein.

The decision on appeal is “that Petitioner has not established by a preponderance of the evidence that any of claims 1, 3, 5, or 7 of the ’853 patent are unpatentable.” J.A. 24. My concern is with the majority’s implicit holding that if the underlying findings of fact are supported by substantial evidence, then we do not review the ultimate legal question of non-obviousness.

I believe that de novo review is appropriate for the questions of law presented herein, along with review of any underlying facts for support by substantial evidence.<sup>1</sup>

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<sup>1</sup> The panel majority misperceives my dissent. I do not “assert[] that we should apply de novo review to this [factual] issue.” Maj. Op. at 11 n.1. I do assert that we should apply de novo review to the issue on appeal, that is, the legal issue of obviousness. “It is emphatically the province and duty of the judicial department to say what the law is. Those who apply the rule to particular cases, must of necessity expound and interpret that rule.” *Marbury v.*

## II

It is not disputed that universal “remotes” were known at the time of the invention described and claimed in the ’853 patent. Communicating commands via both wireless and wired communication methods was well known: “a ‘communication method’ is a medium or protocol for transmitting or receiving information (*e.g.*, CEC [consumer electronics control], IR [infrared], RF [radio frequency], etc.)” Universal Elecs. Br. 5 (citing the ’853 patent col. 2 ll. 4–16, col. 6 ll. 25–28, 62–67, col. 14 ll. 20–24). The Chardon reference describes a “database of CEC and IR command codes.” *Id.* at 1.

In this appeal it is not disputed that a person of ordinary skill in the field of this invention would understand that the CEC and IR command codes listed and disclosed by Chardon are the same as the CEC and IR command codes listed and communicated in the ’853 patent. Chardon shows a Universal Control Engine (“UCE”) receiving a command code from a remote control device, and it shows the UCE employing the applicable communication method to transmit the command to the appliance. This is the subject matter of the ’853 patent. As the panel majority recites, “[t]he ’853 patent’s purported invention is the ability to reliably use different communication methods that enable a single remote control to provide commands to a variety of target appliances, according to the optimal method of communication for each target appliance and command.” Maj. Op. at 3 (citing the ’853 patent col. 2 ll. 16–20).

The panel majority also recites that “Chardon discloses a process for creating a listing of CEC command codes and IR command codes” for communication to remote appliances. *Id.* at 7. Chardon teaches “at least two different

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*Madison*, 5 U.S. 137, 177 (1803). This foundation of appellate review applies whether or not any facts are disputed.



communication methods,” namely CEC and IR, Roku Reply Br. 1, and “[a] skilled artisan would understand that Chardon’s listing of parallel sets of CEC and IR command codes and its description of algorithms for selecting which communication method to use reads precisely on the challenged claims.” *Id.* at 11. Although the parties discuss differences between the details disclosed by Chardon and by the ’853 patent, and the majority recognizes some such differences, these details are unclaimed by the ’853 patent and cannot be used to support non-obviousness.

An example is that for selecting the communications method, the ’853 patent shows use of a “matrix” in Figure 7, and states that the matrix contains the “form of command/transmission to be used and a pointer to the required data value and formatting information for the specific command,” Roku Reply Br. 10 (quoting the ’853 patent col. 7 ll. 26–29), while Chardon lists “both CEC-formatted command codes and a parallel set of IR-formatted command codes.” *Id.* (citing Chardon, ¶¶ [0008], [0039], [0044]). However, any difference in the selection method does not appear in the claims.

Applying the requisite analysis of law and fact, I conclude that the ’853 patent claims at issue would have been obvious in view of Chardon, because the methods described in the claims and the prior art are substantially identical and serve the same purpose and use. I respectfully dissent from my colleagues’ contrary ruling.