

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

PAICE LLC, THE ABELL FOUNDATION, INC.,
Appellants

v.

FORD MOTOR COMPANY,
Appellee

2017-1387, 2017-1388, 2017-1390, 2017-1457, 2017-1458

Appeals from the United States Patent and Trade-
mark Office, Patent Trial and Appeal Board in Nos.
IPR2015-00606, IPR2015-00758, IPR2015-00785,
IPR2015-00799, IPR2015-00801.

PAICE LLC, THE ABELL FOUNDATION, INC.,
Appellants

v.

FORD MOTOR COMPANY,
Appellee

2017-1406

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. IPR2015-00792.

Decided: February 1, 2018

RUFFIN B. CORDELL, Fish & Richardson, PC, Washington, DC, argued for appellants. Also represented by TIMOTHY W. RIFFE, BRIAN JAMES LIVEDALEN, DANIEL TISHMAN.

GABRIEL BELL, Latham & Watkins LLP, Washington, DC, argued for appellee. Also represented by MATTHEW J. MOORE; FRANK A. ANGILERI, SANGEETA G. SHAH, JOHN P. RONDINI, ANDREW B. TURNER, Brooks Kushman PC, Southfield, MI.

Before LOURIE, O'MALLEY, and TARANTO, *Circuit Judges*.
O'MALLEY, *Circuit Judge*.

Paice LLC and The Abell Foundation, Inc. (collectively, "Paice") appeal from final written decisions in six *inter partes* review ("IPR") proceedings, in which the Patent Trial and Appeal Board ("Board") held certain challenged claims of U.S. Patent Nos. 7,237,634 ("634 patent") and 8,214,097 ("097 patent") unpatentable.¹ For the following

¹ See *Ford Motor Co. v. Paice LLC*, IPR2015-00606, Paper No. 33 (P.T.A.B. Nov. 8, 2016) (606 IPR); *Ford Motor Co. v. Paice LLC*, IPR2015-00758, Paper No. 28 (P.T.A.B. Nov. 8, 2016) (758 IPR); *Ford Motor Co. v. Paice LLC*, IPR2015-00785, Paper No. 31 (P.T.A.B. Oct. 21, 2016) (785 IPR); *Ford Motor Co. v. Paice LLC*, IPR2015-00792, Paper No. 30 (P.T.A.B. Oct. 25, 2016) (792 IPR);

reasons, we affirm in part, vacate in part, and remand. In particular, we vacate the Board’s obviousness determinations as they relate to the ’634 patent’s “electrical” claims and remand for the Board to determine whether those claims find written description support in the priority applications and the references incorporated therein. We affirm the Board’s obviousness determinations as to all other claims.

I. FACTUAL BACKGROUND

A. The ’634 and ’097 Patents

The subject matter of the ’634 and ’097 patents has been discussed in considerable detail in previous decisions of this court. *See Paice LLC v. Ford Motor Co.*, 681 F. App’x 885, 887–88 (Fed. Cir. 2017) (*Paice I*) (involving related patent); *Paice LLC v. Ford Motor Co.*, 681 F. App’x 904, 908 (Fed. Cir. 2017) (*Paice II*) (involving related patent); *Paice LLC v. Ford Motor Co.*, 685 F. App’x 940, 943 (Fed. Cir. 2017) (*Paice III*) (involving ’097 patent); *see also Paice LLC v. Ford Motor Co.*, 685 F. App’x 950 (Fed. Cir. 2017) (*Paice IV*) (summary affirmance of Board decision involving the ’634 patent).² We recite here only the background necessary to resolve the issues on appeal.

Paice’s related ’634 and ’097 patents, both titled “Hybrid Vehicles,” are directed to a torque-based algorithm for selecting operating modes in a hybrid vehicle having an internal combustion engine and one or more battery-

Ford Motor Co. v. Paice LLC, IPR2015-00799, Paper No. 30 (P.T.A.B. Nov. 8, 2016) (*799 IPR*); *Ford Motor Co. v. Paice LLC*, IPR2015-00801, Paper No. 28 (P.T.A.B. Oct. 21, 2016) (*801 IPR*).

² Related subject matter is also at issue in appeals 17-1263, 17-1264, 17-1308, 17-1309, 17-1310, 17-1311, 17-1442, and 17-1443, which were argued in tandem with the present appeals.

powered electric motors. The claims at issue generally recite methods for comparing the instantaneous torque required to propel the vehicle, which the patents refer to as “road load” (“RL”), to both a setpoint (“SP”) and the engine’s maximum torque output (“MTO”) to determine whether to operate the engine, the electric motor, or both. ’634 patent, col. 3, ll. 12–21; *id.* col. 13, ll. 12–29, 44–65; *id.* col. 41, l. 4 through col. 43, l. 25 & Fig. 9. Claim 241 of the ’634 patent is representative and recites:

241. A method for controlling a hybrid vehicle, comprising:

determining instantaneous road load (RL) required to propel the hybrid vehicle responsive to an operator command;

operating at least one electric motor to propel the hybrid vehicle when the RL required to do so is less than a setpoint (SP);

operating an internal combustion engine of the hybrid vehicle to propel the hybrid vehicle when the RL required to do so is between the SP and a maximum torque output (MTO) of the engine, wherein the engine is operable to efficiently produce torque above the SP, and wherein the SP is substantially less than the MTO; and

operating both the at least one electric motor and the engine to propel the hybrid vehicle when the torque RL required to do so is more than the MTO;

controlling said engine such that combustion of fuel within the engine occurs substantially at a stoichiometric ratio, wherein said controlling the engine comprises limiting a rate of change of torque output of the engine; and

if the engine is incapable of supplying instantaneous torque required to propel the hybrid vehicle, supplying additional torque from the at least one electric motor.

Id. col. 81, ll. 33–58.

Also at issue are claims that recite limitations related to the voltage and current output of the electric motor's battery. Claim 245, for example, recites a voltage output requirement of “at least approximately 500 volts”:

245. The method of claim 241,

wherein said operating the at least one electric motor comprises supplying energy from a battery;

wherein a maximum DC voltage supplied from said battery is *at least approximately 500 volts*.

Id. col. 82, ll. 1–5 (emphasis added). These “electrical” claims first appeared in a continuation-in-part application filed on April 2, 2001. The '634 patent is a divisional of a divisional of that application.

Finally, several claims of the '634 patent require operating the engine at torque output levels less than the setpoint “under abnormal and transient conditions.” Claim 265, for example, recites:

265. The method of claim 241, further comprising:

operating the engine at torque output levels less than the SP *under abnormal and transient conditions* to satisfy drivability and/or safety considerations.

Id. col. 83, ll. 51–54 (emphasis added). Claims 7, 17, 27, and 37 of the '097 patent also recite this “abnormal and transient conditions” limitation.

B. Overview of the Prior Art

The Board's unpatentability determinations are based on two primary references: (1) U.S. Patent No. 5,343,970 to Severinsky ("Severinsky"), and (2) PCT Application Publication WO 00/15455 ("455 PCT publication"). We briefly describe these references below.

1. Severinsky

Severinsky, which issued to a co-inventor of the '634 and '097 patents, describes a control strategy for selecting operation modes in a hybrid vehicle. Severinsky teaches that its vehicle's internal combustion engine is used only near "its most efficient operational point," which Severinsky defines as when the engine "produces 60–90% of its maximum torque." Severinsky, col. 20, ll. 63–67. Severinsky also describes circumstances in which it is efficient to use the engine (such as "in highway cruising"), other circumstances in which it is more efficient to use an electric motor (such as "in traffic"), and still other circumstances in which torque is supplied by both the electric motor and the engine (such as in "acceleration/hill climbing mode"). *Id.* col. 6, l. 63 through col. 7, l. 16; *see also id.* col. 14, ll. 15–18; *id.* col. 22, ll. 48–51.

We previously considered Severinsky in two appeals from IPR proceedings involving Paice's hybrid vehicle patents. *See Paice II*, 681 F. App'x 904; *Paice III*, 685 F. App'x 940. In those cases, we affirmed the Board's determinations that Severinsky, in combination with other references, renders obvious various claims of Paice's patents.

2. '455 PCT Publication

The '455 PCT publication names the same inventors as the '634 and '097 patents and claims priority to applications that appear in both patents' chain of priority. The publication is directed to similar hybrid vehicle technology.

The '455 PCT publication was published more than one year before the April 2001 continuation-in-part application in which the electrical claims first appeared and therefore nominally qualifies as prior art to those claims under 35 U.S.C. § 102(b) (2006).

II. PROCEDURAL BACKGROUND

In response to a patent infringement suit, Appellee Ford Motor Company (“Ford”) filed twenty-five IPR petitions against Paice’s patents, including those that led to the six proceedings at issue here. The Board held most claims challenged in these proceedings unpatentable as obvious over various combinations of prior art references involving Severinsky and the '455 PCT publication.

Relevant to this appeal, the Board determined that Severinsky discloses a torque-based algorithm for determining which operating mode to select in a hybrid vehicle. *758 IPR*, slip op. at 14–28; *785 IPR*, slip op. at 20–25; *801 IPR*, slip op. at 19–25. The Board also interpreted the term “abnormal and transient conditions” recited in the claims of the '634 and '097 patents as including starting and stopping the engine. The Board agreed with Ford that Severinsky discloses the limitation as construed by the Board. *785 IPR*, slip op. at 14–16, 37, 39, 53–54; *792 IPR*, slip op. at 13–15, 29–32; *801 IPR*, slip op. at 15–16, 28–29, 55–56. Based in part on these findings, the Board held claims 91–92, 112, 125–26, 145, 252–53, 265–66, 278–79, 282, and 290–91 of the '634 patent and claims 7, 17, 27, and 37–38 of the '097 patent unpatentable as obvious over Severinsky in view of other prior art of record.³

³ We address here only those claims that Paice identifies as remaining in dispute. *See* No. 17-1387, Reply Br. 7; No. 17-1406, Reply Br. 1, 2 n.2; *see also* Ltr. from Appellants, *Paice LLC v. Ford Motor Co.*, No. 17-1387,

Finally, the Board determined that the '455 PCT publication discloses the torque-based control strategy recited in the electrical claims of the '634 patent, and that Severinsky discloses the electrical limitations themselves. *606 IPR*, slip op. at 7–20; *799 IPR*, slip op. at 7–18. Based on these findings, the Board held claims 56–65, 68–77, 242–51, 268–77, 292–93, and 298 of the '634 patent unpatentable as obvious over the '455 PCT publication in view of Severinsky.

Paice appealed to this court. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

III. DISCUSSION

Paice raises two principal arguments, and a bevy of subsidiary arguments, on appeal. First, Paice argues that the Board's Severinsky-based findings are unsupported by substantial evidence. In particular, Paice asserts that Severinsky discloses a speed-based algorithm, not a torque-based one as required by the patent claims, and that the Board erred in its construction of "abnormal and transient conditions." Second, Paice argues that the Board erred in finding that the '455 PCT publication qualifies as prior art to the '634 patent's electrical claims. We address each argument in turn.

A. The Board's Severinsky-Based Obviousness Determinations

The Board determined that Severinsky renders obvious various claims of the '634 and '097 patents. Obviousness is a question of law based on underlying factual findings relating to "the scope and content of the prior art, differences between the prior art and the claims at issue,

Dkt. 51 (Fed. Cir. June 29, 2017); Ltr. from Appellants, No. 17-1406, *Paice LLC v. Ford Motor Co.*, Dkt. 46 (Fed. Cir. June 19, 2017).

the level of ordinary skill in the pertinent art, and any objective indicia of non-obviousness.” *Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013) (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007)). We review the Board’s ultimate legal determination of obviousness de novo and its underlying factual findings for substantial evidence. *PPC Broadband, Inc. v. Corning Optical Commc’ns RF, LLC*, 815 F.3d 747, 751 (Fed. Cir. 2016). Substantial evidence is “such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.” *In re Gartside*, 203 F.3d 1305, 1312 (Fed. Cir. 2000) (quoting *Consol. Edison Co. of N.Y. v. N.L.R.B.*, 305 U.S. 197, 229 (1938)).

1. The Board’s Finding That Severinsky Discloses a Torque-Based Control Algorithm

Paice argues that the Board erred in finding that Severinsky discloses a torque-based system for selecting operating modes. According to Paice, Severinsky teaches a speed-based system, and, to the extent Severinsky mentions torque at all, it refers only to the engine’s output torque, which is different from the claimed road load torque. We disagree. As the Board found, Severinsky discloses that a microprocessor may determine “the load (if any) to be provided to the engine by the motor, responsive to *the load imposed by the vehicle’s propulsion requirements*, so that the engine can be operated in its most fuel efficient operating range.” *758 IPR*, slip op. at 18 (emphasis altered) (quoting Severinsky, col. 17, ll. 11–15). The Board found that “the load imposed by the vehicle’s propulsion requirements” is the road load. *Id.* at 18–19. Thus, the Board reasonably concluded that Severinsky’s electric motor can be triggered in response to the vehicle’s road load.

As the Board also found, Severinsky elsewhere states that the microprocessor “determines whether the internal combustion engine or the electric motor or both should

provide *torque to the wheels* under various monitored operating conditions.” *Id.* at 15 (emphasis altered) (quoting Severinsky, col. 6, ll. 19–23). This passage suggests that “torque to the wheels”—i.e., road load—is a criterion for determining which mode of operation to select. Finally, Severinsky states that the combustion engine is used “only in the near vicinity of its most efficient operational point,” which is when the engine “produces 60–90% of its maximum torque.” *Id.* at 16 (quoting Severinsky col. 20, ll. 63–67). Ford’s expert testified that “a skilled artisan would have understood that Severinsky’s lower limit of 60% of MTO is a ‘setpoint.’” *Id.* at 17. Based on that testimony, the Board concluded that Severinsky teaches that its engine operates when the road load reaches a setpoint. The Board’s finding that Severinsky uses road load torque, rather than engine output torque, is reasonable and supported by substantial evidence.

The Board’s findings are also consistent with the ’634 patent’s own description of Severinsky. The ’634 patent states that “an important aspect of the invention of” Severinsky is that, “[w]hen the *vehicle operating conditions require torque* of [a certain] magnitude, the engine is used to propel the vehicle,” but “when less *torque* is required, an electric motor powered by electrical energy stored in a substantial battery bank drives the vehicle.” *785 IPR*, slip op. at 57 (quoting ’634 patent, col. 25, ll. 11–24) (emphases added). As the Board concluded, this and other statements indicate that road load is used to select operating modes and are “probative on how one with ordinary skill in the art at the time of filing of the involved patent would have read and understood the disclosure of the prior art.” *Id.* at 54–55, 57; *see also PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1362 (Fed. Cir. 2007) (“Admissions in the specification regarding the prior art are binding on the patentee for purposes of a later inquiry into obviousness.”).

Paice’s argument that Severinsky discloses a speed-based comparison rather than a torque-based one is undermined by the passages described above. It is true that Severinsky refers to speed when describing certain modes of operation. *See, e.g.*, Severinsky, col. 18, ll. 36–38 (“The vehicle will operate in a highway mode with the engine running constantly after the vehicle reaches a speed of 30–35 mph.”). But, as the Board explained, even if Severinsky describes speed as one factor that can be considered, it describes torque as another factor, as described above. Further, the ’634 patent similarly refers to speed when describing the vehicle’s operating modes, stating that “the traction motor provides torque to propel the vehicle in low-speed situations.” *758 IPR*, slip op. at 20 (quoting ’634 patent, col. 17, ll. 46–47; *id.* col. 19, ll. 45–46). As the Board explained, “Paice cannot hold Severinsky to a different standard than it holds the claimed invention.” *Id.*

We note also that the Board’s findings are consistent with our rulings in *Paice II* and *Paice III*, which involved Severinsky and Paice’s related patents. In those cases, we found that substantial evidence supported the Board’s determination that, “although Severinsky describes the use of speed as a factor considered by the microprocessor, it also uses the vehicle’s torque requirements, or road load, in determining when to operate the engine.” *Paice II*, 681 F. App’x at 915; *Paice III*, 685 F. App’x at 946 (“On this record, the Board had substantial evidence to find that Severinsky discloses comparing the amount of torque required to propel the vehicle to a predetermined torque value in deciding whether to operate the engine.”). And, while we “disagree[d] with the Board’s reinterpretation of ‘road load’ as including output torque,” we affirmed the Board’s finding that “Severinsky relies on road load to start and operate the engine and motor.” *Paice II*, 681 F. App’x at 915. We also rejected many of the same arguments that Paice makes on appeal here. *See, e.g., id.*

(rejecting argument that “Severinsky’s microprocessor uses speed to make such determinations regarding operation of the engine”). Paice does not persuasively explain why a different result is required on this record.

For these reasons, substantial evidence supports the Board’s finding that Severinsky discloses a torque-based system for selecting operating modes.

2. The Board’s Finding That Severinsky Satisfies the “abnormal and transient conditions” Claim Limitation

The Board also found that Severinsky discloses the “abnormal and transient conditions” limitation recited in certain claims of the ’634 and ’097 patents. The Board interpreted “abnormal and transient conditions” to capture “starting the engine and stopping the engine,” including in “city traffic and reverse operation.” *See 785 IPR*, slip op. at 14–16; *792 IPR*, slip op. at 13–15; *801 IPR*, slip op. at 15–16. Paice asserts that the Board’s construction is too broad.

In IPR proceedings, the Board gives claim terms their broadest reasonable interpretation in light of the claims and specification. *See Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142–46 (2016). We review the Board’s ultimate claim constructions de novo and its underlying factual determinations involving extrinsic evidence for substantial evidence. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841–42 (2015); *PPC Broadband*, 815 F.3d at 751.

We agree with the Board’s construction of “abnormal and transient conditions.” The ’634 patent claims do not specify what “abnormal” or “transient” conditions are, stating only that the engine must operate at torque output levels less than the setpoint when such conditions exist in order “to satisfy drivability and/or safety considerations.” ’634 patent, col. 83, ll. 51–54 (claim 265). Further, neither “abnormal” nor “transient” is used in the

patent specifications. With no intrinsic evidence to shed light on the claim term’s meaning, the Board turned to the ’634 patent’s parent patent, U.S. Patent No. 7,104,347 (“’347 patent”), which is at issue in the companion appeals. *See Paice LLC v. Ford Motor Co.*, Nos. 17-1263, 17-1264, 17-1308, 17-1309, 17-1310, 17-1311, 17-1442, 17-1443 (Fed. Cir.). Claim 22 of the ’347 patent recites “abnormal and transient conditions” comprising “starting and stopping of the engine and provision of torque to satisfy drivability or safety considerations.” ’347 patent, col. 60, ll. 17–21.

As the Board correctly found, claim 22 of the ’347 patent does not present a definition, but instead identifies non-limiting examples of abnormal and transient conditions—i.e., (1) starting and stopping of the engine, and (2) provision of torque to satisfy drivability or safety considerations. The Board appropriately concluded that “abnormal and transient conditions” include starting and stopping the engine. This conclusion is reasonable; starting and stopping the engine is a “transient” condition insofar as it is temporary. Once the engine is on, the condition has ceased.

This conclusion, moreover, is consistent with the prosecution history of the ’097 patent. Paice emphasized during prosecution that the “abnormal and transient conditions” recited in the claims “are such conditions as *starting the engine*, during which operation it must necessarily be operated at less than SP for a short time.” J.A. 12,489 (emphasis added).⁴ This statement clearly indicates that “abnormal and transient conditions” encompass at least starting the engine. *See Ventana Med. Sys., Inc. v. Biogenex Labs., Inc.*, 473 F.3d 1173, 1184 (Fed. Cir. 2006) (“As with statements made by the inven-

⁴ Appendix citations are to the joint appendix in appeal No. 17-1387 unless otherwise indicated.

tor during the prosecution of an ancestor application, statements made during the continued prosecution of a sibling application may inform the meaning of the claim language by demonstrating how the inventor understood the invention.” (internal quotation marks omitted)).

Paice makes two arguments as to why the Board nevertheless erred. First, Paice argues that, even if claim 22 of the '347 patent recites two examples of abnormal and transient conditions, the '634 patent claims cover only the latter example—i.e., “provision of torque to satisfy drivability or safety considerations.” It is true that the '634 patent claims require that the engine operate at torque levels less than the setpoint under abnormal and transient conditions “to satisfy drivability and/or safety considerations.” '634 patent, col. 83, ll. 51–54. But operating the engine at output levels less than the setpoint when starting and stopping the engine appears to satisfy those conditions. Indeed, it is reasonable to conclude that operating the engine at low torque as the engine turns on does in fact promote drivability and/or safety considerations because it allows the engine to slowly ramp up to a suitably high rpm.

Second, Paice argues that the Board erred by failing to exclude from its construction starting and stopping the engine during city traffic and reverse operation of the vehicle. According to Paice, it specifically disclaimed such claim scope during prosecution of the '097 patent when it stated that “city traffic and reverse operation are normal conditions.” J.A. 12,489. Again, we disagree. Paice’s statement made during prosecution implies only that city traffic and reverse operation are not, by themselves, abnormal and transient conditions. The statement does not imply that starting and stopping the engine, which is generally an abnormal and transient condition, is no longer such a condition when performed in city traffic or reverse operation. We therefore find that the Board’s

construction of “abnormal and transient conditions” is the broadest reasonable construction of that term.

With respect to the '097 patent, Paice additionally argues that the Board erred in determining that Severinsky discloses the “abnormal and transient conditions” limitation. According to Paice, the Board found that Severinsky discloses operating the engine below the setpoint to preserve the battery’s life, which the Board found satisfies “drivability and safety considerations.” But, Paice asserts, the Board never made a finding that Severinsky discloses operating the engine below the setpoint during “abnormal and transient conditions,” as required by the claims.

We find Paice’s argument unpersuasive. Paice does not contest the Board’s finding that “abnormal and transient conditions” should have the same meaning across the patents. *See Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1334 (Fed. Cir. 2003) (“[W]e presume, unless otherwise compelled, that the same claim term in the same patent or related patents carries the same construed meaning.”). And, as the Board explained, Severinsky describes instances—e.g., “low-speed vehicle operation in traffic”—when it might be “preferable to use the engine somewhat inefficiently rather than to discharge the batteries excessively, which would substantially reduce the battery lifetime.” *792 IPR*, slip op. at 31–32 (quoting Severinsky, col. 18, ll. 23–33 (internal quotation marks omitted)). The Board determined that “Severinsky rationalizes its decision to operate the engine outside its most fuel efficient range”—i.e., below the setpoint—“as a tradeoff between engine efficiency and vehicle drivability and safety considerations.” *Id.* at 31. In other words, Severinsky teaches operating the engine below the setpoint in order to provide torque to satisfy safety and drivability considerations, which is covered by the Board’s construction of “abnormal and transient conditions.” *785 IPR*, slip op. at 15; *792 IPR*, slip op. at 14–15 & n.10.

And, as Ford’s expert explained, Severinsky discloses operating the engine below the setpoint when starting the engine, which, as described above, is a transient condition. No. 17-1406, J.A. 20,284–85. In particular, Severinsky discloses that, during low-speed operation, there are instances in which the “motor will start the engine while driving the vehicle” when the battery is discharged by 10–20%. Severinsky, col.17, ll. 56–64. In other words, Severinsky teaches operating the engine below the setpoint while starting the engine, which is also covered by the Board’s construction.

For these reasons, substantial evidence supports the Board’s findings that Severinsky discloses the “abnormal and transient conditions” limitation recited in the ’634 and ’097 patent claims.

3. Paice’s Additional Contentions

Paice next argues that the Board failed to adequately explain its rationale for finding claims 91–92, 112, 125–26, 145, 252–53, 265, 278–79, 282, and 290 of the ’634 patent unpatentable, and instead improperly adopted Ford’s arguments without explanation. Paice asserts that, in so doing, the Board failed to create an adequate record under *Securities & Exchange Commission v. Chenery Corp.*, 318 U.S. 80 (1943), as to these claims.

Chenery requires that administrative agencies provide a reasoned basis for their decisions. *See id.* at 94 (“[T]he orderly functioning of the process of review requires that the grounds upon which the administrative agency acted b[e] clearly disclosed and adequately sustained.”). In the IPR context, we have interpreted *Chenery*’s mandate as requiring the Board’s explanation to “be capable of being reasonably . . . discerned from a relatively concise . . . discussion.” *In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (internal quotation marks omitted). As we have explained, “it is not adequate to summarize and reject arguments without explaining why the [Board]

accepts the prevailing argument.” *Id.*; *Cutsforth, Inc. v. MotivePower, Inc.*, 636 F. App’x 575, 578 (Fed. Cir. 2016) (holding that the Board failed to provide an adequate record where the “majority of [its] Final Written Decision is spent summarizing the parties’ arguments and offers only conclusory analysis of its own”).

In *NuVasive*, we vacated the Board’s obviousness determinations where the Board neither expressly adopted the petitioner’s arguments regarding motivation to combine nor provided reasoned explanations for crediting the arguments. 842 F.3d at 1384. Similarly, in *Personal Web Technologies, LLC v. Apple, Inc.*, 848 F.3d 987 (Fed. Cir. 2017), we vacated the Board’s obviousness determination where the Board did “not cite, let alone explain or analyze or adopt, an earlier portion of [the] petition that refers to” the relevant passages of the prior art, and essentially found “that a skilled artisan, once presented with the two references, would have understood that they *could be* combined.” *Id.* at 993. We recognized, however, that “[t]he amount of explanation needed to meet the governing legal standards—to enable judicial review and to avoid judicial displacement of agency authority—necessarily depends on context.” *Id.* at 994. Indeed, “[a] brief explanation may do all that is needed if, for example, the technology is simple and familiar and the prior art is clear in its language and easily understood.” *Id.*

Although the technology at issue here is arguably not “simple,” it is familiar based in part on Paice’s repeated arguments in related proceedings and the Board’s hundreds of pages of analysis in these six proceedings. It is clear from the Board’s analysis that it rejected Paice’s primary arguments that (1) Severinsky does not disclose a torque-based system, and (2) “abnormal and transient conditions” excludes starting and stopping the engine in city traffic and reverse operation. The Board’s obviousness determinations flow directly from its rejection of these arguments, and the Board’s analysis is commensu-

rate with Paice's arguments. *See Novartis AG v. Torrent Pharm. Ltd.*, 853 F.3d 1316, 1327–28 (Fed. Cir. 2017) (finding that it would be inappropriate “to find fault in the Board’s arguably limited treatment of [certain] arguments” where the Board’s treatment “was at least commensurate with” the patent owner’s presentation of those arguments).

And, unlike the Board’s decisions in *NuVasive* and *Personal Web Technologies*, the Board’s decisions here cite to the relevant portions of Ford’s briefing that explain how the prior art discloses the relevant claim limitations. *785 IPR*, slip op. at 28–29, 36–39; *801 IPR*, slip op. at 28–29. In this context, the Board’s analysis is readily discernible and sufficient under *Chenery*. *See Ignite USA, LLC v. CamelBak Prods., LLC*, No. 2016-2747, 2017 WL 4548459, at *5 (Fed. Cir. Oct. 12, 2017) (noting that, although it is usually insufficient for the Board to merely reject one side’s arguments, it is sufficient for the Board to explain that it finds the other side’s arguments and supporting evidence more persuasive).

Finally, Paice argues that the Board erred in finding that Severinsky, in combination with the secondary references of record, renders dependent claims 252–53, 265–66, and 291 of the ’634 patent obvious. The Board’s determinations, however, are consistent with our decision in the companion case, *see Paice LLC v. Ford Motor Co.*, Nos. 17-1263, 17-1264, 17-1308, 17-1309, 17-1310, 17-1311, 17-1442, 17-1443 (Fed. Cir.), as well as our decisions in *Paice I* and *Paice III*, in which we rejected many of these same arguments, *see Paice I*, 681 F. App’x at 890–91; *Paice III*, 685 F. App’x at 946. We see no reason to depart from our conclusions in those cases.

We have considered Paice’s remaining arguments as to the Board’s Severinsky-based obviousness determinations and find them unpersuasive. In sum, substantial evidence supports the Board’s findings as to claims 91–92,

112, 125–26, 145, 252–53, 265–66, 278–79, 282, and 290–91 of the '634 patent and claims 7, 17, 27, and 37–38 of the '097 patent. We therefore affirm the Board's obviousness determinations as to those claims.

B. The Board's '455 PCT Publication-Based Findings

The Board also found that the '455 PCT publication, in view of Severinsky, renders obvious the electrical claims of the '634 patent. Paice does not challenge the Board's finding that the references disclose every limitation recited in those claims or that a skilled artisan would have been motivated to combine the references. Instead, Paice argues only that the '455 PCT publication is not prior art to the electrical claims because they claim priority to an application, U.S. Patent Application No. 09/264,817 ("817 application"), that predates the '455 PCT publication.

The priority date for later-added patent claims depends on when the claimed subject matter first appeared in the chain of patent applications from which the claims arose. *Augustine Med., Inc. v. Gaymar Indus., Inc.*, 181 F.3d 1291, 1302 (Fed. Cir. 1999). For claims to be entitled to a priority date of an earlier-filed application, the application must provide adequate written description support for the later-claimed limitations. *Id.*; see also *Progressive Cas. Ins. Co. v. Liberty Mut. Ins. Co.*, 625 F. App'x 552, 558 (Fed. Cir. 2015). Here, Paice asserts that the '817 application incorporates by reference Severinsky, which itself provides the requisite written description support.⁵ The Board rejected that argument, concluding that the '817 application does not incorporate Severinsky, and that

⁵ Paice makes similar arguments with respect to other priority applications, but, because we agree with Paice's arguments as to the '817 application, we find it unnecessary to consider any of those other applications.

the electrical claim limitations lack written description support in the '817 application standing alone. The threshold question on appeal, therefore, is whether the Board's incorporation ruling is in error. We conclude that it is.

Incorporation by reference provides “a method for integrating material from various documents into a host document[] . . . by citing such material in a manner that makes clear that the material is effectively part of the host document as if it were explicitly contained therein.” *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000). “To incorporate material by reference, the host document must identify with detailed particularity what specific material it incorporates and clearly indicate where that material is found in the various documents.” *Id.* Whether and to what extent material has been incorporated by reference is a question of law that we review de novo. *Harari v. Lee*, 656 F.3d 1331, 1334 (Fed. Cir. 2011). “[T]he standard of one reasonably skilled in the art should be used to determine whether the host document describes the material to be incorporated by reference with sufficient particularity.” *Advanced Display*, 212 F.3d at 1283.

The '817 application expressly incorporates Severinsky in the following passage:

This application discloses a number of improvements over and enhancements to the hybrid vehicles disclosed in the inventor's *U.S. Pat. No. 5,343,970 (the "970 patent") [Severinsky], which is incorporated herein by this reference.* Where differences are not mentioned, it is to be understood that the specifics of the vehicle design shown in the '970 patent are applicable to the vehicles shown herein as well.

J.A. 11,174 (emphasis added) (also appearing in the issued '634 patent at col. 10, ll. 40–47). The first sentence

of this passage is broad and unambiguous. It states that Severinsky “*is*,” without qualification, incorporated into the ’817 application “by *this* reference”—i.e., the reference contained in the sentence. The sentence identifies with detailed particularity the specific material subject to incorporation (Severinsky, and not just particular portions thereof) and where that material can be found (U.S. Patent No. 5,343,970). Such language is plainly sufficient to incorporate Severinsky in its entirety. *See Harari*, 656 F.3d at 1335–36 (finding that prior art applications were incorporated in their entirety based on the following “broad and unequivocal language”: “The disclosures of the two applications are hereby incorporate[d] by reference”); *Advanced Display*, 212 F.3d at 1282.

The Board reached a contrary conclusion, however, by relying on the subsequent sentence in the passage, which states: “Where differences are not mentioned, it is to be understood that the specifics of the vehicle design shown in the ’970 patent are applicable to the vehicles shown herein as well.” According to the Board, this sentence limits incorporation to only those disclosures in Severinsky that are not different from disclosures in the ’817 application. Because the Board found differences between Severinsky’s disclosures related to the electrical limitations and the ’817 application’s corresponding disclosures, the Board determined that Severinsky’s disclosures are not incorporated into the ’817 application. The Board’s conclusion is incorrect.

The second sentence merely states that Severinsky’s features are understood to also apply to the vehicles described as the present invention in the ’817 application, except where the ’817 application’s specification “mention[s]” otherwise. In other words, the ’817 application refers to differences from Severinsky only to the extent necessary to describe differences between the inventions of Severinsky and the ’817 application. *See, e.g.*, J.A. 11,179 (“According to the present invention, the controlla-

ble torque-transfer unit shown in the '970 patent [Severinsky] is eliminated by replacing the single electric motor shown therein by two separate motors[.]”); J.A. 11,190 (similar). This statement provides an expedient way for the applicant to describe the invention vis-à-vis Severinsky without describing every feature of Severinsky that is subsumed within the invention.

The sentence has no bearing, however, on the extent of incorporation. It refers only to the applicability of certain features of Severinsky’s *invention* to the '817 application’s purportedly new and improved hybrid vehicle, rather than to which textual portions of the Severinsky *document* are incorporated in the '817 application. The applicability of a document’s disclosed features and the incorporation of the document itself are distinct concepts, and one does not imply the other. *See Modine Mfg. Co. v. U.S. Int’l Trade Comm’n*, 75 F.3d 1545, 1553 (Fed. Cir. 1996) (“[I]ncorporation by reference does not convert the invention of the incorporated patent into the invention of the host patent.”); *see also Fifth Generation Comput. Corp. v. Int’l Bus. Machs. Corp.*, 416 F. App’x 74, 80 (Fed. Cir. 2011) (agreeing that certain prior art references were incorporated into the host patent but disagreeing “that every concept of the prior inventions is necessarily imported into every claim of the later patent”); *S. Clay Prods., Inc. v. United Catalysts, Inc.*, 43 F. App’x 379, 383–84 (Fed. Cir. 2002) (finding incorporation notwithstanding the host patent’s criticism of the incorporated patent’s invention). When read in context, the passage makes clear that it incorporates the entire Severinsky document into the '817 application, but applies only some of the specific features of Severinsky’s invention disclosed in that document to the '817 application’s invention.

In reaching its contrary conclusion, the Board emphasized the differences between the inventions of the '817 application and Severinsky. But such differences are

present in every case in which one patent purports to incorporate another, because, in every case, the host patent purports to improve upon that which it incorporates. See *In re Schoenwald*, 964 F.2d 1122, 1123 (Fed. Cir. 1992) (“Paramount among the patentability requirements is that that which is sought to be patented must be new.”); see also *ContentGuard Holdings, Inc. v. Apple Inc.*, 701 F. App’x 957, 958 n.1 (Fed. Cir. 2017) (“The ’053 patent incorporates by reference the Stefik patents and purports to improve upon the inventions disclosed therein.”). This case is no different. In fact, the first sentence in the incorporation passage quoted above clearly acknowledges such differences in the form of “improvements” and “enhancements” over Severinsky. See J.A. 11,174 (“This application discloses a number of improvements over and enhancements to the hybrid vehicles disclosed in [Severinsky.]”); see also J.A. 11,176 (“[I]t is desired to . . . provid[e] a substantially simplified parallel hybrid system as compared to those shown in the prior art, again as including the ’970 [Severinsky] patent.”). Yet, the function of that sentence is to incorporate Severinsky *despite* such differences.

Even if the second sentence in the ’817 application’s incorporation clause could be read as a narrow incorporation, our holding in *Harari v. Lee* would foreclose the Board’s conclusion. The patent application at issue in *Harari* contained two incorporation clauses. In the first clause, the application stated that “[t]he disclosures” of two prior art applications “are hereby incorporate[d] by reference.” *Harari*, 656 F.3d at 1335. In the second clause, the application stated that only the “[r]elevant portions” of the disclosures are incorporated. *Id.* We held that the “broad and unequivocal language” of the first clause “incorporates the entire disclosures of the two applications,” and that the second clause’s narrower language did not diminish the scope of incorporation. *Id.* at 1335–36. Similarly, here, the first sentence in the

passage quoted above incorporates the entire disclosure of Severinsky, and the second sentence—even if relevant to incorporation—does not negate or otherwise limit the broad incorporation effectuated by the first sentence as the Board found and as Ford urges.

At oral argument before this court, Ford sought to distinguish *Harari* on grounds that, in that case, there were two incorporation clauses separated by several paragraphs of text, in contrast to this case, where the two sentences in dispute appear in a single incorporation clause. Oral Arg. at 26:45–27:12, *Paice LLC v. Ford Motor Co.* (No. 2017-1387), <http://oralarguments.cafc.uscourts.gov/default.aspx?fl=2017-1387.mp3>. According to Ford, the “juxtaposition of the two sentences back-to-back” in the ’817 application would inform a skilled artisan that differences are not incorporated therein. *Id.* at 27:53–28:20.

Ford’s purported distinction of *Harari* on the basis that the incorporation clauses at issue were separated by text is not persuasive. We said nothing in *Harari* about the proximity of the incorporation clauses, predicating our holding instead on the “broad and unequivocal language” of the first incorporation clause, and notwithstanding that the incorporation “occurred during a discussion of” particular teachings. And, while we agree with Ford that *Harari* commands that incorporation clauses be read in context, we disagree that the sentences at issue here limit the scope of incorporation when so read. The ’817 application’s incorporation passage provides no nexus between the “differences” referenced in the second sentence and the incorporation referenced in the first sentence, in contrast to cases in which we have found incorporation to be limited. *See, e.g., Zenon Envtl., Inc. v. U.S. Filter Corp.*, 506 F.3d 1370, 1379 (Fed. Cir. 2007) (finding that the language “[f]urther details relating to the construction and deployment of a most preferred skein are found in [prior art patents], the relevant disclosures of each of

which are included by reference” “expressly limit[ed] the incorporation to only relevant disclosures of the patents, indicating that the disclosures are not being incorporated in their entirety”); *Cook Biotech Inc. v. Acell, Inc.*, 460 F.3d 1365, 1375–76 (Fed. Cir. 2006) (finding incorporation of only particular teachings from a prior art patent where the host document’s incorporation clause stated that “the procedure for preparing intestinal submucosa” detailed in the prior art patent was “expressly incorporated herein by reference”). There is no reasonable basis to conclude that the ’817 application’s second sentence limits the incorporation set forth in the first sentence.

Ford also asserted for the first time at oral argument that our decisions in *Callaway Golf Co. v. Acushnet Co.*, 576 F.3d 1331 (Fed. Cir. 2009), and *Husky Injection Molding Systems Ltd. v. Athena Automation Ltd.*, 838 F.3d 1236 (Fed. Cir. 2016), support the Board’s ruling. But, in both cases, we found that the incorporation clauses at issue *did* in fact incorporate the relevant passages of the prior art into the host documents. And, in any event, those cases are inapposite.

In *Callaway Golf*, the incorporation clause stated that “[r]eference is made to [the prior art patent] which describes a number of foamable compositions of a character which may be employed for one or both layers 14 and 16 for the golf ball of this invention.” 576 F.3d at 1345, 1346–47 (emphasis omitted). We found that this passage adequately “identifie[d] with specificity both what material is being incorporated by reference (foamable polymeric compositions suitable for golf ball cover layers) and where it may be found (the [prior art] patent).” *Id.* at 1346. The passage at issue here is far more explicit, and, as described above, makes clear that Severinsky is incorporated in its entirety, unlike the much more limited and ambiguous clause at issue in *Callaway Golf*.

In *Husky Injection*, as in *Harari*, there were two incorporation clauses at issue. The first clause stated that “[t]he tie-bar nuts can be secured . . . by any appropriate mechanism, such as the pineapple and toothed-ring mechanism described in [the prior art patent],” while the second clause stated that “[a]ll cross-referenced patents and application[s] referred to in this specification are hereby incorporated by reference.” 838 F.3d at 1248 (emphasis added). As in *Callaway Golf*, we held that the clauses incorporated relevant passages of the prior art because they “identifie[d] with sufficient particularity what” they incorporate from the prior art—i.e., toothed locking mechanisms. *Id.* at 1248. We therefore held that the two clauses “work in concert to incorporate at least some portions of” the prior art patent. *Id.* at 1249. But, because we held that the relevant passages from the prior art were incorporated, we found it unnecessary to determine whether the second, broader clause incorporated the prior art patent in its entirety. *Id.* (“It is therefore of no consequence whether Glaesener’s broader statement in fact incorporates the rest of Choi, *i.e.*, in its entirety.”). Here, by contrast, we find that the first sentence in the ’817 application’s incorporation passage incorporates Severinsky in its entirety, and *Husky Injection* is therefore inapposite.

To the extent Ford cites *Callaway Golf* and *Husky Injection* for the proposition that incorporation language must be read in context and holistically, we agree. And, as described above, when so read, the incorporation clause at issue here incorporates Severinsky in its entirety. We conclude that the Board erred in holding otherwise.⁶

⁶ In a previous appeal involving the same parties, we stated in a footnote that Severinsky is incorporated by reference in the related ’347 patent. See *Paice II*, 681 F.

That conclusion, however, does not end the inquiry. To prevail on its argument that the '455 PCT publication is not prior art to the electrical claims, Paice must show that the '817 application, with Severinsky incorporated therein, provides sufficient written description support for those claims. And, although the Board analyzed the '817 application to determine whether it provides such support, the Board did not analyze Severinsky for that purpose.

The written description inquiry is a highly fact-intensive one that “requires fact findings this court is not permitted to make.” *Bilstad v. Wakalopoulos*, 386 F.3d 1116, 1126 (Fed. Cir. 2004); *Union Oil Co. of Cal. v. Atl. Richfield Co.*, 208 F.3d 989, 1000 (Fed. Cir. 2000) (noting that “written description questions are intensely factual, and should be dealt with on a case-by-case basis, without the application of wooden rules”). We therefore remand for the Board to determine in the first instance whether the '817 application, with Severinsky incorporated therein, supplies the requisite written description support for the '634 patent's electrical claims. In other words, the Board must consider Severinsky for that purpose on remand.⁷

App'x at 914 n.4. The '347 patent specification contains the same incorporation language at issue here.

⁷ Although the Board found, in the context of its incorporation-by-reference analysis, certain “differences” between Severinsky's electrical disclosure and the '817 application's corresponding disclosure, such differences do not necessarily preclude a finding that Severinsky provides written description support for the electrical limitations recited in the '634 patent claims. *See 606 IPR*, slip op. at 9 (agreeing with Ford that, for purposes of obviousness, Severinsky “teaches the specific voltage, current, and ratio values recited by the challenged claims”).

Finally, with respect to the electrical claims that recite a low electrical current—i.e., a current below approximately 75 amperes or 150 amperes, *see, e.g.*, '634 patent, col. 63, ll. 30–31 (claim 58); *id.*, col. 86, ll. 52–54 (claim 293)—Paice argues that the Board erred in finding that the '817 application, standing alone, does not provide adequate written description support. We do not address that argument here. If, on remand, the Board concludes that Severinsky fails to provide the requisite written description support for the low current claims, the Board should reconsider its finding that the '817 application, on its face, does not provide such support.

IV. CONCLUSION

For the reasons stated above, we affirm the Board's obviousness determinations as to claims 91–92, 112, 125–26, 145, 252–53, 265–66, 278–79, 282, and 290–91 of the '634 patent and claims 7, 17, 27, and 37–38 of the '097 patent. We vacate, however, the Board's determination that claims 56–65, 68–77, 242–51, 268–77, 292–93, and 298 of the '634 patent are obvious over the '455 PCT publication in view of Severinsky, and remand for proceedings consistent with this opinion.

AFFIRMED IN APPEAL NO. 17-1406

**AFFIRMED IN PART, VACATED IN PART, AND
REMANDED IN APPEAL NOS. 17-1387, 17-1388,
17-1390, 17-1457, AND 17-1458**

COSTS

No costs.