

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BROAD OCEAN TECHNOLOGIES, LLC,
Petitioner,

v.

NIDEC MOTOR CORPORATION,
Patent Owner.

Case IPR2015-01617
Patent 7,990,092 B2

Before JAMES A. TARTAL, PATRICK M. BOUCHER, and
ROBERT J. WEINSCHENK, *Administrative Patent Judges*.

BOUCHER, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background

This proceeding originates from a corrected Petition (Paper 6, “Pet.”) filed by Broad Ocean Technologies, LLC (“Petitioner”) challenging all claims of U.S. Patent No. 7,990,092 B2 (Ex. 1001, “the ’092 patent”), which is owned by Nidec Motor Corporation (“Patent Owner”). We previously issued a Final Written Decision with respect to a portion of the challenges addressing claims 7–13, but not with respect to the Petition’s remaining challenges. Paper 31 (“Prior Final Written Decision” or “Dec.”). The Federal Circuit “affirm[ed] the Board’s determination that claims 7–13 were not shown to be unpatentable” but remanded the proceeding in accordance with *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348 (2018), “for institution of inter partes review with respect to claims 1–6 and issuance of a Final Written Decision addressing those claims.” *Broad Ocean Techs., LLC v. Nidec Motor Corp.*, 727 F. App’x 686 (Fed. Cir. 2018).

After institution of *inter partes* review on remand (Paper 44) Petitioner filed an opening Remand Brief (Paper 46, “Br.”), to which Patent Owner responded (Paper 52, “PO Resp.”), Petitioner replied (Paper 58), and Patent Owner filed a Sur-reply (Paper 63). An oral hearing was held with the Parties, and a copy of the transcript was entered into the record. Paper 69 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a). Based on the record before us,

Petitioner has not shown, by a preponderance of the evidence, that claims 1–13 of the '092 patent are unpatentable.

B. The '092 Patent

The '092 patent “relates to blower motors and controls used in residential heating, ventilation, and air conditioning (HVAC) systems.” Ex. 1001, 1:21–23. In particular, the '092 patent addresses inefficiencies that result from the use of fixed-speed or multiple-speed permanent split capacitor (“PSC”) motors, which generally have two independent power connections to accommodate heating or cooling operational modes. *Id.* at 2:4–9. As the '092 patent explains, such inefficiencies are avoided in newer HVAC systems that use variable-speed motors, such as brushless permanent magnet (“BPM”) motors that allow for electronic control to match airflow requirements. *Id.* at 2:66–3:5. Accordingly, the '092 patent describes “an improved ‘drop-in’ replacement for a PSC motor in an HVAC system to realize the advantages of a variable speed blower motor without requiring significant changes to the HVAC system.” *Id.* at 3:43–46.

With such a drop-in replacement, embodiments described in the '092 patent also provide “methods to adjust the torque settings of an HVAC blower motor” because “HVAC OEMs [i.e., original equipment manufacturers] often desire blower motors specifically designed to work with their HVAC equipment.” *Id.* at 4:64–67. In particular, such embodiments “make[] it easier to customize HVAC motors for particular

OEMs' needs, by providing a simple method of adjusting the torque values of a blower motor without changing the motor's winding taps or otherwise altering the motor's physical design." *Id.* at 5:6–11.

One example is illustrated with Figure 14 of the '092 patent, which is reproduced below.

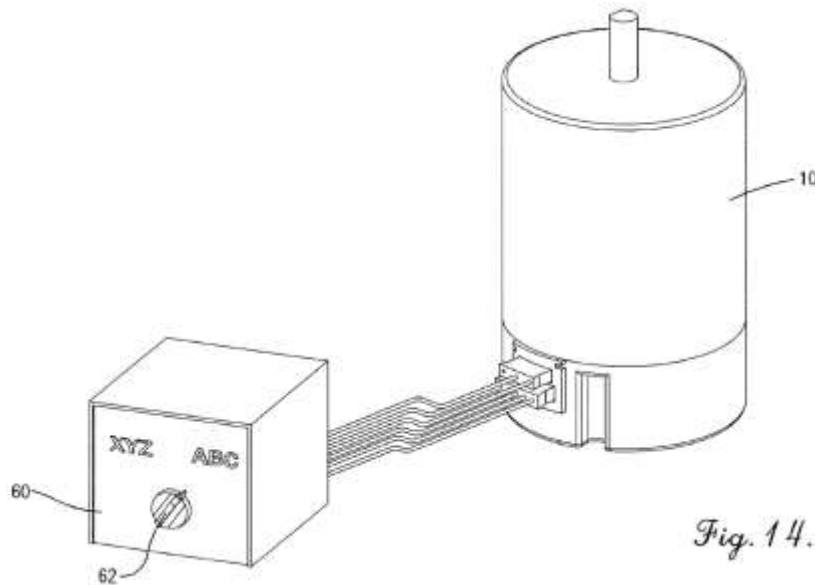


Figure 14 illustrates torque adjustment mechanism 60, which allows one to adjust the torque settings of a motor, such as blower motor assembly 10. *Id.* at 15:27–31. The illustration contemplates two models of HVAC equipment, designated “XYZ” and “ABC,” which the patent uses as examples to illustrate torque adjustment to accommodate both models of equipment in accordance with a state of selector switch 62. *Id.* at 15:37–48. Within this illustration, “[t]he XYZ model may be optimized with a blower motor having a maximum torque capability of 26.1 inch-lbs., and the ABC model may be optimized with a blower model having a maximum torque

capability of 28.5 inch-lbs.” *Id.* at 15:39–42. The ’092 patent asserts that “[a]s used herein, the term multiple torque settings means two or more torque settings, such as the five torque settings described below,” and provides the following example of values for a motor having “5 power inputs with the following torque settings,” for a “Standard Motor,” the “XYZ Motor,” and the “ABC Motor”:

	Standard Motor	XYZ Motor	ABC Motor
IN1	100% 30 inch-lbs	100% 26.1 inch-lbs	100% 28.5 inch-lbs
IN2	90% 27 inch-lbs	90% 23.5 inch-lbs	90% 25.7 inch-lbs
IN3	80% 24 inch-lbs	80% 20.9 inch-lbs	80% 22.8 inch-lbs
IN4	70% 21 inch-lbs	70% 18.3 inch-lbs	70% 20.0 inch-lbs
IN5	30% 9 inch-lbs	30% 7.8 inch-lbs	30% 8.6 inch-lbs

Id. at 15:49–16:21. A simple calculation confirms that the torque settings for the XYZ Motor are all 87% of those for the Standard Motor, and that the torque settings for the ABC Motor are all 95% of those for the Standard Motor.

Circuitry such as that shown in Figure 15 of the ’092 patent (not reproduced here) is used to instruct a motor controller “to change its torque settings by an adjustment factor.” *Id.* at 16:25–29. The ’092 patent describes multiple ways in which the torque settings may be selected in accordance with such an adjustment factor: “The selector switch 65 may have several positions (such as the XYZ and ABC positions described above) or may permit the selection of any DC output value within a range

such as 60-100 volts (corresponding to 60% to 100% of the maximum rated torque of the motor).” *Id.* at 16:29–33. In the latter case, “if the selector switch 65 on the DC power supply 64 is set to output 60 volts, all of the torque settings of the motor are proportionally scaled down to 60% of their original values.” *Id.* at 16:47–50. Alternatively, the motor controller “could store a plurality of different torque or speed tables and select one of the torque/speed tables based on an input provided by the torque adjustment mechanism.” *Id.* at 16:63–66. By way of example, the ’092 patent explains that when the torque adjustment mechanism is set to output 60 volts, “the motor controller may select torque/speed table #1 from its memory,” and when the torque adjustment mechanism is set to output 61 volts, “the motor controller may select table #2.” *Id.* at 16:67–17:5.

The ’092 patent also describes a further example in which the motor controller stores a plurality of “torque or speed tables,” one of which is selected based on an input provided by the torque adjustment mechanism. *Id.* at 16:63–66. In this example, the ’092 patent describes connecting a neutral power cable to “CW” or “CCW” (corresponding to the clockwise or counterclockwise fan direction for a reversible blower motor) neutral inputs to select between motor parameters. *Id.* at 10:61–65. The patent explains that “the CW input may be associated with a first speed table and the CCW input may be associated with a second speed table,” such as the speed tables shown below. *Id.* at 10:65–11:24.

	Speed Table 1	Speed Table 2
IN1	100%	95%
IN2	90%	85%
IN3	80%	75%
IN4	70%	65%
IN5	60%	55%

C. Illustrative Claims

Independent claims 1 and 7 of the '092 patent are illustrative of the claims at issue:

1. A method of adjusting torque values of a motor having multiple torque settings and a maximum rated torque value, the method comprising:

selecting an adjustment factor to obtain an adjusted maximum torque value that is less than the maximum rated torque value wherein the adjustment factor is a percentage between 60% and 99%;

adjusting all the torque settings of the motor with the adjustment factor to obtain proportionally reduced torque settings; and

operating the motor at the proportionally reduced torque settings.

7. A method of adjusting torque values of an HVAC motor having multiple torque settings and a maximum rated torque value, the method comprising:

selecting an adjustment factor to obtain an adjusted maximum torque value that is less than the maximum rated torque value;

selecting a torque table associated with the adjustment factor, the torque table including alternate torque settings; and

operating the motor at the alternate torque settings.

Ex. 1001, 17:35–18:5, 18:17–27.

D. Evidence Relied Upon

Petitioner relies on the following references.

Beifus	US 2007/0205732	Sept. 6, 2007	Ex. 1007
Chen	US 2008/0188173	Aug. 7, 2008	Ex. 1008

Kerstin Lesley Kenty, *Use of Electronically Commutated Motors (ECMs) in Air Terminals*, DA-07-035, ASHRAE Transactions, pp. 334–41 (Ex. 1009) (“Kenty”).

Prior art described at column 2, line 66, to column 3, line 12, of the '092 patent (Ex. 1001).

Petitioner also provides Declarations by Michael D. Sidman, Ph.D. Exs. 1010, 1017. Dr. Sidman was cross-examined by Patent Owner, and transcripts of his depositions were entered into the record. Exs. 2001, 2009. Patent Owner provides Declarations by Mark N. Horenstein, Ph.D. Exs. 2002, 2011. Dr. Horenstein was cross-examined by Petitioner, and transcripts of his depositions were entered into the record. Exs. 1013, 1020.

E. Instituted Grounds of Unpatentability

On remand, we instituted trial based on the following grounds.¹

Paper 44, 8–9.

Reference(s)	Basis	Claims Challenged
Beifus	§ 102(b)	1–6
Chen	§§102(a), 102(e)	1–5 and 7–12
Chen and Beifus	§ 103(a)	6 and 13
Chen and Kenty	§ 103(a)	6 and 13
Chen and prior art described in the '092 patent	§ 103(a)	6 and 13

F. Related Proceedings

The Parties assert that the '092 patent is the subject of *Nidec Motor Corp. v. Broad Ocean Motor LLC*, 2:15-cv-00443-JRG-RSP (E.D. Tex.).

¹ We do not address herein the challenge of claims 7–13 as anticipated by Beifus because the Federal Circuit affirmed our prior conclusion that Petitioner's showing with respect to such claims was insufficient. *Broad Ocean*, 727 F. App'x at 686. Patent Owner objects to our consideration of other challenges to claims 7–13 as part of this remand proceeding as exceeding the scope of the Federal Circuit's mandate. See Paper 45 (Patent Owner's request for rehearing with respect to challenges to claims 7–13); Paper 48 (denying request for rehearing); Tr. 38:17–20 ("I want to note just at the outset that Nidec does continue to reserve its objection that the remand did not include Claims 7 to 13 in this proceeding, and that, therefore that aspect of this proceeding should not be before the Board and shouldn't be ruled on."). We previously explained that Patent Owner's objection is not persuasive. Paper 48, 2–6.

Pet. 1; Paper 7, 2. Patent Owner also identifies *Nidec Motor Corp. v. SNTech, Inc.*, 4:12-cv-00115 (E.D. Mo.) as involving the '092 patent. Paper 7, 2.

II. ANALYSIS

A. Claim Construction

In an *inter partes* review proceeding based on a petition filed prior to November 13, 2018, the Board interprets claims of an unexpired patent using the broadest reasonable construction in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b) (2017); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). Under the broadest reasonable interpretation standard, claim terms generally are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). An inventor may provide a meaning for a term that is different from its ordinary meaning by defining the term in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

1. Prior Adopted Constructions

In the Prior Final Written Decision, we adopted the following claim constructions. Dec. 6.

Claim Term	Preliminary Construction
“motor having multiple torque settings”	a motor that receives multiple discrete pre-set torque demand values, which may be expressed with units that include inch-pounds or percentages of a maximum torque rating or operating torque value
“adjustment factor”	a quantity that defines a quantitative relationship between a maximum rated torque value and an adjusted maximum torque value
“torque table”	includes a torque curve graphically representing a set of torque values in a memory connected to the motor
“adjustment factor . . . selected based on characteristics of an HVAC enclosure”	includes any input to or any setting or adjustable parameter of a motor controller that relate to the air flow/ventilation through the blower motor enclosure or that of the surrounding air ducts or one or more of temperature stratification, humidity, pressure, or combinations thereof

We see no compelling reason to modify these constructions based on the positions of the Parties as developed during remand, and adopt them also for this Decision. With respect to the construction of “torque table,” we also see no compelling reason to depart from our prior determination in agreement with Patent Owner that “[t]he broadest reasonable interpretation of ‘table’

still must require the torque values to be stored in the table.” *Id.* at 7 (quoting Paper 20, 9).

2. “*adjustment factor*”

Independent claims 1 and 7 both recite “selecting an adjustment factor to obtain an adjusted maximum torque value that is less than the maximum rated torque value.” Ex. 1001, 17:38–40, 18:20–22. Although we previously construed “adjustment factor” as set forth in the table above—notably applied to claim 7 in the Prior Final Written Decision—Petitioner advocates on remand for a different construction for that phrase as applied to claim 7, but not claim 1. Br. 18–19; Tr. 27:21–28:6 (Petitioner agreeing that it is “advocating for different constructions for that phrase in Claim 1 and Claim 7”). According to Petitioner, in referring to the construction applied in the Prior Final Written Decision, “there is no support in the ’092 patent specification for such a narrow construction of the ‘adjustment factor’ term as it is used in claim 7.” Br. 18. Instead of that construction, Petitioner proposes that the term be construed, for claim 7 and its dependents, as “any input to or any setting or adjustable parameter of a motor controller by which a torque table is selected.” *Id.* at 19.

Multiple considerations cause us to reject Petitioner’s proposal. Most significantly, the presumption that “the same phrase in different claims of the same patent should have the same meaning is a strong one, overcome only if ‘it is clear’ that the same phrase has different meanings in different

claims.” *In re Varma*, 816 F.3d 1352, 1363 (Fed. Cir. 2016) (citations omitted). At the oral hearing, Petitioner drew our attention to *Haemonetics Corp. v. Baxter Healthcare Corp.*, 607 F.3d 776, 782 (Fed. Cir. 2010), and *Wilson Sporting Goods. Co. v. Hillerich & Bradsby Co.*, 442 F.3d 1322, 1328 (Fed. Cir. 2006), as supporting its position that different constructions are appropriate “when the specification warrants it.” Tr. 28:1–6. In both those cases, the context provided by the specific claim language recited was of particular relevance. *See Haemonetics*, 607 F.3d at 782 (“[T]he description of two embodiments with each tracking the language of different independent claims most reasonably supports a construction in which ‘centrifugal unit’ has one meaning in claim 1 and another in claim 16.”); *Wilson*, 442 F.3d at 1328 (“In this case, the claims use the term ‘gap,’ but then modify it differently to suggest differences in the geometry of the ‘gap’ in the various claims.”).

We are not presented with an analogous circumstance here because the context provided by independent claims 1 and 7 for the recited “adjustment factor” is identical: both claims require that the adjustment factor be selected “to obtain an adjusted maximum torque value that is less than the maximum rated torque value.” Ex. 1001, 17:38–40, 18:20–22. Petitioner’s argument distinguishes between certain of the embodiments summarized above: “[t]he ’092 patent specification discloses two alternative embodiments where an input may be used to select a torque table: one involving selecting a torque/speed table based on an output of 60 volts or 61

volts, . . . and one involving sensing of current in a CW neutral input.” Br. 18. According to Petitioner, in these embodiments, “neither the specific voltage level of the DC power supply’s output nor the presence of current on the CW neutral input defines a quantitative relationship between a maximum related torque value and an adjusted maximum torque value.” *Id.* at 19.

We agree with Patent Owner that this argument “demonstrates [Petitioner’s] conflation of how an adjustment factor is selected with what the adjustment factor is.” PO Resp. 7–8. In proposing a construction of “adjustment factor” as “any input to or any setting or adjustable parameter of a motor controller by which a torque table is selected,” Petitioner divorces the construction from the claim’s specific requirement that selection of the adjustment factor “obtain an adjusted maximum torque value that is less than the maximum rated torque value.” As summarized above, the ’092 patent discloses embodiments that specifically include a quantitative relationship between the maximum rated torque value and the adjusted maximum torque value. Such embodiments include the XYZ and ABC motor settings, which respectively correspond to 87% adjusted maximum torque and 95% adjusted maximum torque. *See* Ex. 1001, 15:49–16:22. Such embodiments also include the selection of reduced settings of 60–100% depending on the position of the selector switch, quantitatively corresponding directly to the adjusted maximum torque. *See id.* at 16:30–56.

We thus agree with Patent Owner’s assertion, supported by the testimony of Dr. Horenstein, which we credit, that the table *selection*

processes identified by Petitioner “have no bearing on the clear disclosure that the adjustment factor of each of the alternative torque tables is the percentage reduction used to create the table entries as would be understood by one of ordinary skill in the art.” PO Resp. 10 (citing Ex. 2011 ¶¶ 19–27). Particularly in light of the strong presumption regarding use of the same phrase in different claims, and in light of specific support in the specification that corresponds both to the embodiments covered by claim 1 and by claim 7 when a common meaning is ascribed, we do not find that “it is clear” that the same phrase must be accorded different meanings. *See Varma*, 816 F.3d at 1363.

We also agree with Patent Owner that Petitioner’s attempt to seek a new construction of “adjustment factor” at this stage is improper. *See* PO Resp. 8. Importantly, the Petition does not advocate for different constructions of the phrase in different claims. *See* Pet. 12–14. Both the Supreme Court and the Federal Circuit have emphasized the singular importance of the petition in *inter partes* reviews in framing the scope of trial. *SAS Inst.*, 138 S. Ct. at 1355 (“Much as in the civil litigation it mimics, in an *inter partes* review the petitioner is master of its complaint.”); *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’” (citing 35 U.S.C. § 312(a)(3))). Furthermore, the Federal

Circuit has considered and affirmed our original construction of “adjustment factor” in the specific context of its use in independent claim 7. *Broad Ocean*, 727 F. App’x at 686 (“We affirm the Board’s determination that claims 7–13 were not shown to be unpatentable.”). Petitioner has identified insufficient basis to disturb a court holding that is binding on us.

3. “*adjusting all the torque settings of the motor*”

Independent claim 1 of the ’092 patent recites “adjusting *all* the torque settings of the motor with the adjustment factor to obtain proportionally reduced torque settings.” Ex. 1001, 18:1–3 (emphasis added). Petitioner proposes that, in this phrase, the term “all” “should be construed to require only that each and every selected torque setting have its original stored torque value reduced by the adjustment factor when the motor is operated at that selected torque setting by the motor controller.” Br. 17. According to Petitioner, “all *the* torque settings of the motor” in this limitation refers only to the “multiple torque settings” recited in the preamble of claim 1 because the preamble provides the only antecedent basis for the recitation. *Id.* at 14 (citing *Haemonetics*, 607 F.3d at 782).

The problem with Petitioner’s proposal is that it would render inclusion of the word “all” in the construction of the phrase meaningless. See Tr. 16:15–17:13 (Petitioner agreeing that the claim would not differ in scope if, under its proposed construction, the word “all” were removed: “I don’t think that it would make a difference because of the inclusion of the

word ‘the’ after the ‘all.’”). Constructions that render claim language superfluous are strongly disfavored. *See, e.g., In re Power Integrations, Inc.*, 884 F.3d 1370, 1376 (Fed. Cir. 2018) (“Another problem with the board’s construction is that it renders claim language meaningless.”). Rather, “[a] claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.” *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) (citations omitted).

We otherwise agree with Patent Owner that specific “[c]onstruction of the term ‘all’ is unnecessary since one of skill in the art would understand ‘all’ has its ordinary meaning when used in the context of the ’092 patent.” PO Resp. 15. As Patent Owner asserts, “the limitation ‘adjusting all the torque settings of the motor with the adjustment factor’ means adjusting all pre-set torque settings of the motor, for the entire operational range of the motor, with the same adjustment factor.” *Id.* at 15–16. Notably, this is consistent with the embodiments summarized above in which the XYZ and ABC Motors respectively have torque settings that are 87% and 95% of those for the Standard Motor, as well as with those embodiments in which “all of the torque settings of the motor are proportionally scaled down.” *See* Ex. 1001, 16:47–50.

4. “associated with”

Independent claim 7 recites “selecting a torque table associated with the adjustment factor.” Ex. 1001, 18:24–25. In its opening Remand Brief,

Petitioner proposes that the phrase “associated with” be construed to mean “directly or indirectly related to.” Br. 20. Patent Owner disputes that proposal in its Response, contending that incorporating “indirectly related” in the construction would “expand the ordinary meaning to render ‘associated’ almost meaningless.” PO Resp. 13.

Notwithstanding this dispute, the Parties agreed at the oral hearing that the phrase means that “the adjustment factor acts as a pointer to the torque table that is selected.” Tr. 9:16–10:3 (Petitioner agreeing), 60:7–61:5 (Patent Owner asserting “But it’s a pointer. That’s the selection mechanism. It’s pointing to a particular table.”).

We agree with this characterization, which is consistent with how the specification of the ’092 patent describes selection of a torque table in the relevant embodiments. See Ex. 1001, 15:49–16:50. Accordingly, we construe “selecting a torque table associated with the adjustment factor” as selecting a torque table pointed to by the adjustment factor.

B. Anticipation of Claims 1–6 by Beifus

1. Overview of Beifus

Beifus relates to “methods and approaches used to control the operating characteristics of an electrically commutated motor [(‘ECM’)], specifically emulating operation of an induction motor.” Ex. 1007 ¶ 1. Figure 5 of Beifus is reproduced below.

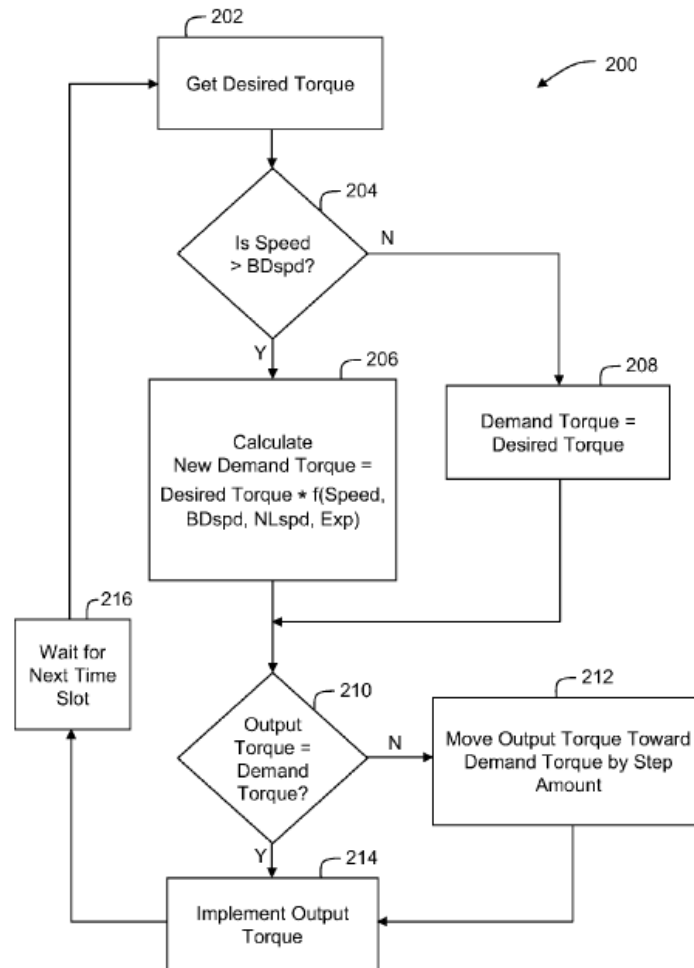


FIG. 5

Figure 5 “is a flowchart illustrating emulation of an induction motor using an ECM.” *Id.* ¶ 10. After receiving a desired torque at a control circuit of the ECM, as indicated at step 202, a determination is made at step 204 whether the ECM operating speed is greater than the induction motor breakdown speed. *Id.* ¶ 33. A new torque demand is calculated at step 206 “if a speed associated with the desired operating torque is greater than a

breakdown speed of the induction motor”; otherwise, a demand torque for the motor is set at step 208 “to be substantially equal to the desired operating torque for the motor if the speed associated with the desired operating torque is less than the breakdown speed of the motor.” *Id.* If it is determined at step 210 that the output torque is substantially equal to the torque demand, the motor is operated at step 214 at the output torque; otherwise the output torque is moved toward the demanded torque at step 212, such as “by slowly stepping the output torque toward the demanded torque” for operation at the moved output torque at step 214. *Id.* ¶¶ 33–34. Such steps are repeated, as indicated at step 216, at the next available processing cycle of the ECM control circuit. *Id.* ¶ 34.

Beifus discloses multiple embodiments for calculation of the new torque demand at step 206. In one embodiment, the new torque demand is calculated as

$$\text{Desired Operating Torque} \times \left[1 - \frac{(\text{i. m. operating speed} - \text{i. m. breakdown speed})^n}{(\text{i. m. noload speed} - \text{i. m. breakdown speed})^n} \right],$$

with “i.m.” indicating the “induction motor” values and n being a real number. *Id.* ¶ 35. The Petition identifies the coefficient of the “Desired Operating Torque” in this expression as corresponding to the “adjustment factor” recited in independent claim 1. Pet. 30. In another embodiment, the induction-motor breakdown speed in the above expression is replaced with

$$\text{i. m. noload speed} - \text{per unit torque demand} \times (\text{i. m. noload speed} - \text{i. m. breakdown speed}).$$

Ex. 1007 ¶ 35.

Beifus respectively refers to these two embodiments as “Option1” and “Option2” in the illustration provided in Figure 6, which is reproduced below.

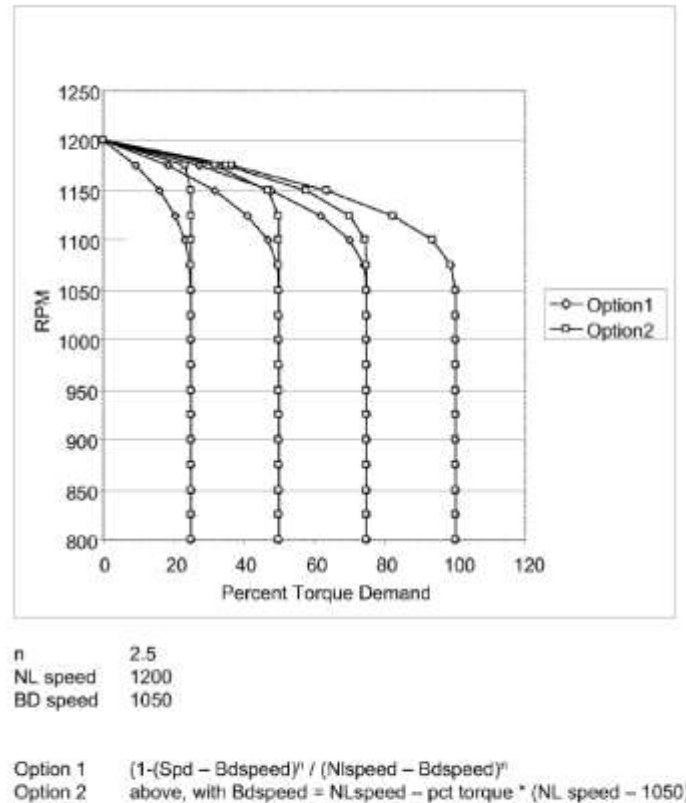


FIG. 6

Figure 6 provides speed-torque curves for both embodiments when $n=2.5$, the induction motor no-load speed is 1200 rpm, and the induction motor breakdown speed is 1050 rpm. *Id.* ¶¶ 35–36. Beifus describes the drawing as “illustrative of key characteristic points of an induction motor speed-torque curve that might be stored, for example, within a memory of an ECM

control circuit.” *Id.* ¶ 36. Beifus explains that “[t]hese key characteristic points include, for example, breakdown speed, noload or synchronous speed, and a shape description number that controls the shape of the curve between the two speeds.” *Id.*

We addressed this disclosure at length in the Prior Final Written Decision, and found that, through these statements, Beifus discloses that the “key characteristic points” (which are not torque values) are stored within a memory of an ECM control circuit, but does not disclose that the torque values themselves are stored. Dec. 9–18. That finding has been affirmed by the Federal Circuit, and we see no compelling reason to disturb it on remand. *See Broad Ocean*, 727 F. App’x at 686. Accordingly, we incorporate herein our previous analysis, set forth at pages 9 to 18 of the Prior Final Written Decision.

2. Anticipation Under *Kennametal*

Petitioner presents two theories to support its position that claims 1–6 are anticipated by Beifus. First, Petitioner relies on the following statement describing the law of anticipation as set forth in *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376 (Fed. Cir. 2015):

A prior art reference can only anticipate a claim if it discloses all the claimed limitations “arranged or combined in the same way as in the claim.” However, a reference can anticipate a claim even if it “d[oes] not expressly spell out” all the limitations arranged or combined as in the claim, if a person of skill in the

art, reading the reference, would “at once envisage” the claimed arrangement or combination.

Kennametal, 780 F.3d at 1381 (citations omitted); see Br. 34 (also citing *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1341–44 (Fed. Cir. 2016)). Petitioner maintains that there are “two alternatives disclosed in Beifus for handling torque values -- storing [the torque values] and calculating [the torque values from the stored key characteristic points].” Br. 36. According to Petitioner, one of these alternatives, namely storing the torque values in the memory of an ECM control circuit, is anticipatory. See *id.* at 29–42. Specifically, Petitioner argues that the reasoning of *Kennametal* is applicable because “[t]he two alternatives disclosed in Beifus . . . are less than the 15 alternative combinations present in *Kennametal*.” *Id.* at 36.

There are several problems with Petitioner’s position. As we made clear in the Prior Final Written Decision, Petitioner’s reliance on the reasoning of *Kennametal* is improper because it was not raised in the Petition. Dec. 18–19 (citing 37 C.F.R. § 42.23(b) (“A reply may *only* respond to arguments raised in the corresponding opposition, patent owner preliminary response, or patent owner response.”) (emphasis added); *CBS Interactive, Inc. v. Helferich Pat. Lic., LLC*, Case IPR2013-00033, slip op. at 3 (PTAB Aug. 9, 2013) (Paper 79) (“Should there be improper arguments or evidence presented with a reply, the Board, exercising its discretion, may

exclude the reply and related evidence in their entirety, or alternatively, decline to consider the improper arguments and/or related evidence.”)).

But more fundamentally, we disagree with the premise upon which Petitioner grounds its reasoning, namely that Beifus discloses an embodiment in which the memory of the ECM control circuit stores the torque values. As Patent Owner asserts, whether Beifus discloses such an embodiment was “the critical factual issue tried to the Board” in the original trial. PO Resp. 2. The evidence Petitioner now relies on largely duplicates evidence that was considered in reaching our factual finding that Beifus does not disclose such an embodiment, namely: the disclosure of Beifus, testimony by Petitioner’s expert Dr. Sidman, and the disclosure of U.S. Patent No. 5,791,332 (Ex. 1011, “Thompson”).

According to Petitioner, Dr. Sidman’s redirect testimony during the original trial supports its assertion that “upon reading Beifus, a person of ordinary skill would immediately recognize that the ECM control circuit could handle the torque demand values in two ways -- storing a set of torque demand values in a memory or by calculating the torque demand values ‘on the fly.’” Br. 31–32 (citing Ex. 2001, 40:7–48:2). Petitioner contends that Patent Owner’s expert, Dr. Horenstein, “testified to the same effect” on cross-examination. *Id.* at 32 (citing Ex. 1013, 30:1–14). But even crediting the experts’ testimony as supporting this position does not comport with the Federal Circuit’s clarification that “*Kennametal* does not stand for the proposition that a reference missing a limitation can anticipate a claim if a

skilled artisan viewing the reference would ‘at once envisage’ the missing limitation.” *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 851 F.3d 1270, 1274 (Fed. Cir. 2017).

With respect to Thompson, Petitioner contends that it “discloses that speed-torque curves can be stored in the ECM’s memory in the form of a lookup table, which comprises speed and torque data points stored in an array.” Br. 33. Petitioner uses this disclosure to argue that “a person of ordinary skill would understand the term ‘programmed’ as it is used in Beifus’ paragraph 0011 includes the storage of data points in an ECM’s memory.” *Id.* at 34. Again, this argument departs from the reasoning presented in the Petition, which did not rely on Thompson for the anticipation challenge to claims 1–6. Rather, the Petition only relied on Thompson in the context of claim 7’s recitation of a “torque table,” which is a feature that is not recited in claims 1–6. *See* Pet. 22–23, 29–34.

Petitioner newly cites Thompson in the context of claims 1–6 in an effort to disturb factual findings that have been affirmed by the Federal Circuit. But the “doctrine of law of the case generally bars the retrial of issues that were previously resolved.” *Intergraph Corp. v. Intel Corp.*, 253 F.3d 695, 697 (Fed. Cir. 2001). This doctrine applies in administrative proceedings, including at the Board, and Petitioner has not established that new material evidence, a change in law, or manifest injustice warrant departing from factual findings already affirmed by the Federal Circuit. *See Ex parte Fong Pong*, Appeal No. 2016-002217, 2017 WL 5714381, at *3

(PTAB Nov. 6, 2017) (citing PTAB Standard Operating Procedure 2, Rev. 9, § VI(B) (“An opinion is binding law of the case, even if it is not designated as precedential, informative, or representative.”)).

Because we find that Beifus does not disclose storage of torque values in the memory of the ECM control circuit, we conclude that Beifus also does not disclose “a motor having multiple torque settings,” as recited in the preamble of independent claim 1. Ex. 1001, 17:35–36. That is, what Beifus discloses is not commensurate with our construction of that phrase as a motor that receives multiple pre-set torque demand values. Petitioner asserts that the Board previously found to the contrary, citing the original Institution Decision. Br. 29 (citing Paper 10, 16). But “the Board is not bound by any findings made in its Institution Decision. At that point, the Board is considering the matter preliminarily without the benefit of a full record. The Board is free to change its view of the merits after further development of the record, and *should do so* if convinced its initial inclinations were wrong.” *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016).

The Parties’ experts disagree whether Beifus discloses storage of torque values in memory. In support of Petitioner’s position, its expert, Dr. Sidman, testifies as follows:

The following operating characteristics of the IM motor are stored in the ECM motor control circuit: the induction motor speed torque curve lookup table, the IM motor breakdown speed, the IM motor no-load speed, and the shape description number

(denoted “*n*” in Beifus of the speed-torque curve used by the ECM control circuit[]).

Ex. 1017 ¶ 60 (citing Ex. 1007 ¶¶ 32–33, Figs. 5, 6). But as Patent Owner’s expert, Dr. Horenstein, counters, the portion of Beifus cited by Dr. Sidman does not enumerate “the induction motor speed torque curve lookup table” as among the information stored. Ex. 2011 ¶ 44 (emphasis omitted). Because Dr. Horenstein’s opinion is more directly grounded in the actual disclosure of Beifus, we give greater weight to his testimony than we do to Dr. Sidman’s. We are also persuaded by Dr. Horenstein’s assessment that “if a ‘speed-torque-curve lookup table’ were being stored, it would be superfluous to store the . . . ‘key characteristics,’ which are only needed to calculate a new demand torque.” *Id.* As Dr. Horenstein also testifies, the sample curves shown in Figure 6 of Beifus “demonstrate the princip[les] of operation but do not represent multiple pre-set torque demand values.” Ex. 2011 ¶ 32.

Beifus also does not disclose “adjusting *all* the torque settings of the motor with the adjustment factor to obtain proportionally reduced torque settings,” as also recited in independent claim 1, as we have construed that phrase. Ex. 1001, 18:1–3 (emphasis added). As evident graphically from Figure 6 of Beifus, and as expressly asserted in the reference, Beifus only discloses that “[w]hen the motor speed is between the breakdown speed and the no load speed, the torque is scaled by a factor less than one.” Ex. 1007 ¶ 32 (emphasis added). That Beifus discloses adjusting torque values only

under certain conditions is further confirmed by steps 204 and 206 shown in Figure 5 of Beifus.

We also find unavailing Petitioner's argument that "part-time satisfaction of the limitations of method claim 1 of the '092 patent is sufficient for Beifus to anticipate that claim." See Br. 39 (citations omitted). It is certainly true that "a prior art product that sometimes, but not always, embodies a claimed method nonetheless teaches that aspect of the invention." *Hewlett-Packard Co. v. Mustek Sys., Inc.*, 340 F.3d 1314, 1326 (Fed. Cir. 2003). Petitioner also draws our attention to *Software Rights Archive, LLC v. Facebook, Inc.*, 659 F. App'x 627, 642 (Fed. Cir. 2016), which confirms that general principle. Br. 39–40. But as Patent Owner responds, "[p]art time' anticipation is only possible if the claims do not impose restrictions, here 'adjusting all the torque settings,' that nullify that concept." PO Resp. 27. Certainly, Beifus *sometimes* adjusts *some* of the torque settings. The point is not that Beifus does not *always* adjust some of the torque settings; rather, the point is that Beifus *never* adjusts *all* of the torque settings as the claim requires. Expressed differently, this is not an instance in which Beifus sometimes meets the claim language and sometimes does not; rather Beifus *never* meets the claim limitation because it does not disclose any circumstance under which *all* the torque settings are adjusted.

3. *Alternative Argument*

Petitioner alternatively argues that “[c]laims 1-6 are also anticipated under §102(b) by Beifus’ ‘on-the-fly’ embodiment depicted in Figure 5 and does so without any reliance upon a *Kennametal* theory of anticipation.”

Br. 42. This argument suffers from the same defects that we discuss above, namely that Beifus neither discloses “a motor having multiple torque settings,” as recited in the preamble of claim 1, nor “adjusting all the torque settings of the motor with the adjustment factor to obtain proportionally reduced torque settings,” as recited in the body of claim 1.

Petitioner’s argument relies on calculations by Dr. Sidman of “the value of the adjustment factor for both Option 1 and Option 2 over the entire operating speed range (800 RPM to 1200 RPM) of the Beifus motor.” *Id.* at 46. As Petitioner asserts, “[t]he value of the option 1 adjustment factor falls within the range of 60% to 99% recited in claim 1 between 1060 RPM and 1155 RPM.” *Id.* at 46–47. And “[t]he value of the Option 2 adjustment factor falls within the range of 60% to 99% recited in claim 1 between 1130 RPM and 1160 RPM.” *Id.* at 47 (citing Ex. 1017 ¶¶ 66–67). Petitioner repeats its part-time anticipation argument that “[a]s a matter of law, this part-time satisfaction of the limitations of method claim 1 of the ’092 patent is sufficient for Beifus to anticipate that claim.” *Id.*

But Dr. Sidman’s calculations merely provide an alternative way of presenting the information shown in Figure 6 of Beifus that equally highlights the fact that Beifus does not disclose adjusting *all* the torque

settings. This is evident from the fact that the range of adjustment determined by Dr. Sidman is less than the full operating range of the motor identified by Petitioner.

4. Summary

We conclude that Petitioner does not demonstrate, by a preponderance of the evidence, that independent claim 1 is anticipated by Beifus. Because claims 2–6 depend from claim 1, Petitioner’s analysis suffers from the same defects as applied to those claims. We therefore also conclude that Petitioner does not demonstrate, by a preponderance of the evidence, that claims 2–6 are anticipated by Beifus.

C. Anticipation by Chen

1. Overview of Chen

Chen describes “HVAC equipment, systems, and methods that provide for some degree of compensation for variations in ductwork restriction in different installations” and that “at least partially compensate for changes in airflow restriction that occurred after the system was commissioned.” Ex. 1008 ¶ 5. A controller directs operation of a motor of the HVAC system by dynamically adjusting operating parameters of the HVAC system, including by adjusting motor speed or torque if airflow is outside an optimal operating range of a target airflow. *Id.* ¶¶ 29–30.

Figure 2 of Chen is reproduced below.

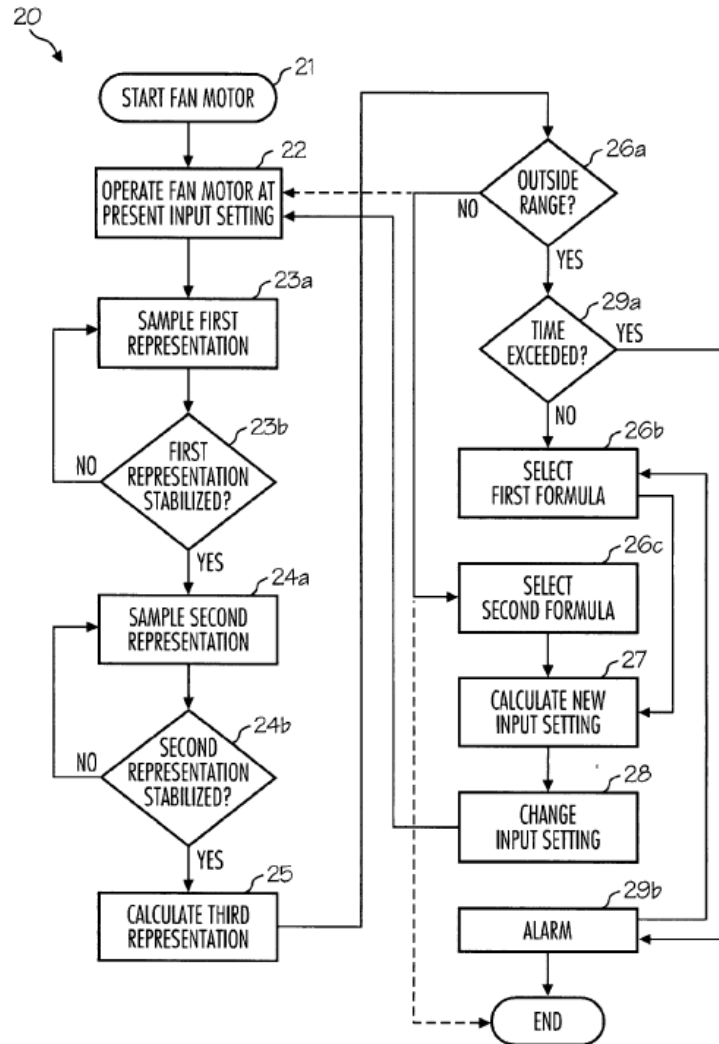


Fig. 2

Figure 2 is a flow diagram that illustrates “an example of a method of controlling an airflow rate within a ventilation system.” *Id.* ¶ 46. At step 21, a fan motor, such as a fan motor within the ventilation system, is started, and the fan motor is operated at a present input setting at step 22.

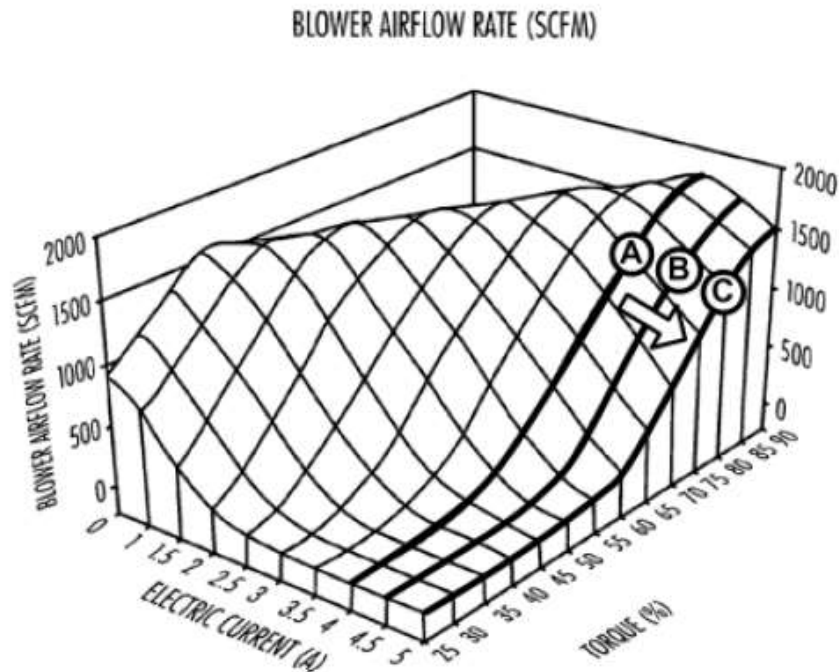
Id. ¶ 47. The “present input setting” may, for example, be “a present motor speed setting or a present motor torque setting.” *Id.* Chen explains that the present input setting may be initially selected “to provide a predicted airflow rate within the ventilation system that is less than the target airflow rate,” with specific embodiments ranging from 25% to 90% of the target airflow rate. *Id.* ¶ 69.

Chen generalizes its discussion by referring to “representations” in the drawing, which may include speed, torque, frequency, voltage, or various quantities derived from such parameters. *See, e.g., id.* ¶ 49 (“As used herein, a ‘representation’ of a parameter may be (includes) the actual value of the parameter (e.g., with particular units), a value that is proportional to the parameter, or another value that is used to represent or substitute for the parameter.”). For clarity of description, and because of its particular relevance to this proceeding, we limit further discussion of the method of Figure 2 to an embodiment in which the “first representation” is torque, the “second representation” is motor current, and the “third representation” is airflow.

At steps 23a and 23b, the torque is sampled until it is stable. *Id.* ¶¶ 49–50. Similarly, at steps 24a and 24b, the motor current is sampled until it is stable, and at step 25, the airflow is sampled. *Id.* ¶ 51–52. If the sampled airflow is outside a particular range, as checked at step 26a, a new input setting is calculated at step 27 and implemented at step 28. *Id.* ¶ 61. Chen discloses various methods for achieving convergence to the target

airflow rate, using a single formula, a pair of formulas, or a greater number of formulas. *Id.* ¶¶ 61, 62. Figure 2 illustrates the example of using a pair of formulas, one of which is referred to as a “course [*sic*] formula” to achieve relatively quick convergence, and the other of which is referred to as a “fine or cruise control formula” to achieve smaller incremental changes, as indicated at steps 26b and 26c. *Id.* ¶ 62. After sufficient convergence to the target airflow rate is achieved, the fan motor may continue to operate at the present input setting. *Id.* ¶ 63.

Chen discloses that a “plot” may be created, “either graphically or in the form of a look-up table, for example, that expresses or embodies” relevant relationships among parameters used in converging the present airflow rate to the target airflow rate. *Id.* ¶ 64. A version of Figure 4 of Chen modified by Petitioner is reproduced below.



Pet. 43; Br. 51. Chen’s Figure 4 “is an example of a three-dimensional plot of airflow rate, electric current, and motor torque, for an example of a fan and motor assembly.” Ex. 1008 ¶ 64. Petitioner has modified the drawing to highlight specific two-dimensional curves within the three-dimensional plot, corresponding to an electric current of 4.0 A, 4.5 A, and 5.0 A, which it respectively labels “A,” “B,” and “C.” Pet. 43; Br. 51.

2. Claims 1–5

The Petition provides claim charts at pages 44–48 setting forth Petitioner’s position that claims 1–5 are anticipated by Chen. In certain important respects, Petitioner’s remand argument deviates from the argument presented in its Petition.

For example, the Petition identifies the “adjustment factor” in Chen as corresponding to the selection of an initial value for the present input setting as a percentage of a value predicted to provide the target airflow rate.

Pet. 41–42, 45. In our original Institution Decision, we found that Petitioner inadequately explained, with such a correspondence, “how adjustment of torque settings is ‘*with the adjustment factor*’ (emphasis added), which was used for a different purpose in Chen.” Paper 10, 21. We reach no different conclusion now because Petitioner provides no argument that elucidates how that limitation could be met with such a correspondence. As Patent Owner observes, “the initial setting of the torque demand during the start-up routine, ‘selecting an adjustment factor,’ is the *last* referenced use of that adjustment factor in Chen’s algorithm.” PO Resp. 38. Rather, “Chen’s control loop and repeated adjustments described above adjust in different amounts or factors over time and are conditional.” *Id.*

In addition, as Patent Owner also observes, the step identified by Petitioner only calculates new input settings when the present airflow rate is outside an operable range. *Id.* at 40. “In some circumstances no change will be made and the system will continue to operate at the present input setting, in others use of a second formula to calculate a new input setting for operating the motor might be employed.” *Id.* The Petition insufficiently explains how Chen’s percentage calculation at start-up (or even how Chen’s coarse or fine formula) is used to adjust *all* torque settings as required by independent claim 1.

Furthermore, the Petition addresses claim 1's requirement of "proportionally reduced torque settings" by asserting that "[r]eading the plot of Chen's Figure 4 over an operating range of 4 Amps to 5 Amps, curve B and curve C *appear to be* proportional reductions of the [airflow rate] vs. Torque (%) in curve A." Pet. 46 (emphasis added). At the oral hearing, Petitioner confirmed that the only evidentiary support for the statement is a visual inspection by Dr. Sidman and that "[t]here's no other basis" to conclude that the reductions are, in fact, proportional. Tr. 30:18–31:9. Regardless, even if the reductions were proportional, they are reductions in *airflow rate*, not in *torque*, as the claim requires.

On remand, Petitioner presents a new and materially different argument. Although presentation of such an argument is improper, we address this new argument in the interest of a complete record. See *Intelligent Bio-Systems*, 821 F.3d at 1369 ("It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify 'with particularity' the 'evidence that supports the grounds for the challenge to each claim.'" (citing 35 U.S.C. § 312(a)(3))).

On remand, Petitioner instead asserts that "[t]he 'adjustment factor' in Chen are the data points in each one of the torque curves disclosed in Figure 4, with the maximum torque being limited to 90%." Br. 55 (citing Ex. 1017 ¶ 87). Referring to our construction of "adjustment factor," Petitioner states that "each data point in Chen Figure 4 would qualify as a 'quantity that defines a quantitative relationship between a maximum rated torque value

and an adjusted maximum torque value.” *Id.* Petitioner reasons that Chen discloses independent claim 1’s limitation of “adjusting all the torque settings of the motor with the adjustment factor” because any of the data points in Figure 4 “would necessarily result in a proportionally reduced torque setting, namely, a torque setting that will be 90% or less than the maximum torque value.” *Id.* at 56 (citing Ex. 1017 ¶ 89).

This argument is untenable because it does not consider the relevant limitation as a whole. Independent claim 1 recites “adjusting *all* the torque settings of the motor with the adjustment factor *to obtain proportionally reduced torque settings.*” Ex. 1001, 18:1–3 (emphases added). First, Petitioner’s argument reads out the claim’s requirement of “obtain[ing] proportionally reduced torque settings” when it identifies *any* data point in Figure 4 as corresponding to the recited “adjustment factor.” That is, according to Petitioner’s argument, different torque settings would be adjusted with different adjustment factors, contrary to our explanation above the properly construed claim requires that same adjustment factor be used for all the torque settings. Effectively, Petitioner’s argument makes no distinction between “reduced torque settings” and “proportionally reduced torque settings”; the latter phrase unambiguously requires, particularly in the context of adjusting “all” the torque settings, that the reduction be proportionally the same among the different torque settings. This is illustrated in the specification of the ’092 patent, for example, with embodiments in which the XYZ and ABC Motors respectively have torque

settings that are 87% and 95% of those for the Standard Motor. *See* Ex. 1001, 15:58–17:21.

We conclude that Petitioner does not demonstrate, by a preponderance of the evidence, that independent claim 1 is anticipated by Chen. We similarly conclude, by virtue of the dependence of claims 2–5 from claim 1, that Petitioner also does not demonstrate, by a preponderance of the evidence, that those claims are anticipated by Chen.

3. Claims 7–12

Independent claim 7 recites “selecting a torque table associated with the adjustment factor, the torque table including alternate torque settings.” Ex. 1001, 18:24–25. In addressing this limitation, the Petition asserts that “Chen’s Figure 4 discloses a plurality of torque data values graphically represented as a plot or surface against Cartesi[a]n coordinates along an x-, y-, and z-axis (which correspond to Blower Airflow Rate, Electric Current, and Torque %) by virtue of its plurality of different torque curves.” Pet. 50 (citing Ex. 1010 ¶ 58). This identification is problematic on its face because, as Patent Owner observes, Chen’s Figure 4 “is in fact not a torque table but an airflow table.” PO Resp. 45; *see* Ex. 2011 ¶ 74. We credit the testimony of Dr. Horenstein on this point, who explains that “[t]he curve [in Figure 4] does not illustrate alternate torque settings, and its output is not a set of alternative torque settings used to set the torque demand values of a motor.” Ex. 2011 ¶ 74.

Furthermore, Petitioner insufficiently explains how the table of Figure 4 is “associated with” the adjustment factor. This deficiency is particularly strong when the adjustment factor is considered to correspond to the initial start-up value in Chen’s method, as identified in the Petition. *See* Pet. 49. As Dr. Horenstein testifies, “Chen discloses that data such as those graphed in Fig. 4 may be used in steps 25, 26b, or 26c, (Chen, ¶¶ [0076], [0081]), but on its face these data are unrelated to the alleged selected adjustment factor of step 21.” Ex. 2011 ¶ 74. That is, the selection of start-up values with which to operate Chen’s motor does not point to the specific plot shown in Figure 4, as required by our adopted construction of “associated with.”

On remand, Petitioner argues that “[o]ne of a plurality of individual torque tables of which the three-dimensional airflow rate/electric current/torque lookup table is comprised in Figure 4 will necessarily be selected based on an adjusted input setting from step 22 during the first or second formulas in steps 26b and 26c, since that input setting will contribute, at least in part, to the torque value (and hence torque table) in Figure 4 to be selected via one or both formulas.” Br. 57–58. It is unclear from this argument whether Petitioner is maintaining its position that Figure 4 is a torque table. Regardless, though, Chen explains that Figure 4 may be generated “by measuring the characteristics of the motor . . . and blower or fan . . . in a laboratory environment, for example, via a wind tunnel test.” Ex. 1008 ¶ 64. The results of such an experimental generation

are used in calculating the airflow rate at step 25, irrespective of the initial start-up value used at step 22. *See id.* That is, nothing in Chen suggests that one start-up value particularly points to Figure 4, as required by our construction of “associated with,” because the data of Figure 4 are applied in the method regardless of what start-up value is used.²

We conclude that Petitioner does not demonstrate, by a preponderance of the evidence, that independent claim 7 is anticipated by Chen. We similarly conclude, by virtue of the dependence of claims 8–12 from claim 7, that Petitioner also does not demonstrate, by a preponderance of the evidence, that those claims are anticipated by Chen.

D. Obviousness of Claims 6 and 13

Claims 6 and 13 depend respectively from independent claims 1 and 7 and recite that “the variable speed motor is a brushless permanent magnet motor.” Ex. 1001, 18:15–16, 18:38–39. In the Petition, Petitioner challenges claims 6 and 13 for obviousness over Chen and Beifus, over Chen and Kenty, and over Chen and prior art described in the ’092 patent.

² In discussing anticipation of claims 1–5 by Chen, Petitioner refers to “a lookup table, such as the one disclosed in Chen’s Figures 4 and 6.” Br. 54. Petitioner does not discuss Figure 6 in addressing anticipation of claims 7–12 by Chen. *See id.* at 56–58. Nevertheless, we note Patent Owner’s concern that Petitioner “appears to expand its arguments to include disclosure of Chen’s figure 6 as a basis for anticipation.” PO Resp. 46. Because Figure 6 was not relied upon in the Petition, we agree with Patent Owner that an argument applying it would be improper. *See id.*

Pet. 53–56. On remand, however, Petitioner addresses only the combination of Chen and Beifus. Br. 58–62.

Each of the obviousness challenges relies on the anticipation arguments with respect to the independent claims from which claims 6 and 13 depend. Pet. 53–56. Those challenges thus suffer from the respective defects of the challenges to the underlying independent claims. Accordingly, we conclude that Petitioner does not demonstrate, by a preponderance of the evidence, that claims 6 and 13 are unpatentable.

III. ORDER

It is

ORDERED that, based on a preponderance of the evidence, claims 1–13 of U.S. Patent No. 7,990,092 B2 have not been shown to be unpatentable;

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

IPR2015-01617
Patent 7,990,092 B2

PETITIONER

Steven F. Meyer
Joseph A. Farco
Howard Lim
LOCKE LORD LLP
smeyer@lockelord.com
jfarco@lockelord.com
hlim@lockelord.com

PATENT OWNER

Scott R. Brown
Matthew B. Walters
HOVEY WILLIAMS LLP
sbrown@hoveywilliams.com
mwalters@hoveywilliams.com

pgc