

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLIED MATERIALS, INC.,
Petitioner,

v.

OCEAN SEMICONDUCTOR LLC,
Patent Owner.

IPR2021-01339
Patent 8,676,538 B2

Before MIRIAM L. QUINN, JOHN D. HAMANN, and
DAVID COTTA, *Administrative Patent Judges*.

COTTA, Administrative Patent Judge.

JUDGMENT

Final Written Decision

Determining All Challenged Claims Unpatentable

35 U.S.C. § 318(a)

Denying-in-Part and Dismissing-in-Part Petitioner's Motion to Strike

37 C.F.R. § 42.23

I. INTRODUCTION

Applied Materials, Inc. (“Petitioner”)¹ filed a Petition to institute *inter partes* review of claims 1–16, 18–26, and 28–31 of U.S. Patent No. 8,676,538 B2 (Ex. 1001, “the ’538 patent”). Paper 1 (“Pet.” or “Petition”). We instituted trial on February 9, 2022. Paper 14 (“Inst. Dec.”). During trial, Ocean Semiconductor LLC (“Patent Owner”)² filed a Patent Owner Response. Paper 18 (“PO Resp.”). Later filings include Petitioner’s Reply (Paper 27 (“Reply”))³ and Patent Owner’s Sur-reply (Paper 35 (“Sur-reply”)). We also authorized Petitioner to file a Motion to Strike (Paper 38 (“Mot.”)) to which Patent Owner filed an Opposition (Paper 41 (“Mot. Opp.”)) and Petitioner filed a Reply (Paper 42 (“Mot. Reply”)). Paper 41. An oral hearing was held on November 15, 2022, and a transcript is entered in the record. Paper 48 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6(b). After considering the parties’ arguments and evidence, we determine that Petitioner has proved by a preponderance of the evidence that the challenged claims are unpatentable.

¹ Petitioner identifies itself, Applied Materials, Inc., as the real party-in-interest. Petitioner also identifies PDF Solutions, Inc. as a “potential real party-in-interest” with whom Petitioner states it “discussed this Petition and the Grounds presented.” Pet. 1. Petitioner further lists a number of other “potential real parties-in-interest, none of whom had any access to this Petition,” according to Petitioner. *Id.* at 1–2.

² Patent Owner identifies itself, Ocean Semiconductor LLC, as the real party-in-interest. Paper 5, 2.

³ Paper 27 is an “amended” version of the Reply filed earlier the same day. Petitioner filed an amended version of its Reply to correct what we deemed to be a harmless error in its original filing. Ex. 3001.

See 35 U.S.C. § 316(e). Our reasoning is explained below, and we issue this Final Written Decision under 35 U.S.C. § 318(a). We also deny in part and dismiss in part Petitioner’s motion to strike.

A. Related Proceedings

According to the parties, Patent Owner has asserted the ’538 patent against multiple third-parties including: Analog Devices, Inc.; Infineon Tech. AG; Huawei Device USA, Inc; MediaTek Inc.; NVIDIA Corp.; NXP Semiconductors NV; Renesas Elec. Corp.; Silicon Labs. Inc.; STMicroelectronics Inc.; and Western Digital Tech., Inc., in lawsuits in district courts in the District of Massachusetts and the Western District of Texas. Pet. 2; Paper 31, 2. Petitioner indicates that it is not a party to any pending litigations involving the ’538 patent. Pet. 10.

B. Asserted Grounds of Unpatentability

Petitioner asserts two grounds of unpatentability in this Petition (Pet. 17–18), which are provided in the table below:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 2, 6, 9–13, 18–19, 21–23, 28, 29	102(e) ⁴	Brcka ⁵
3–5, 7, 8, 14–16, 20, 24–26, 30, 31	103(a)	Brcka

⁴ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 102 and 103. Based on the filing date of the ’538 patent, we apply the pre-AIA versions of §§ 102 and 103.

⁵ Brcka et al., U.S. Patent Publication No. 2006/0259198 A1, published Nov. 16, 2006 (Ex. 1005, “Brcka”).

Petitioner relies on the declaration of Dr. Stanley Shanfield, among other evidence. Ex. 1003. Patent Owner relies on the declaration of Kurt D. Humphrey, among other evidence. Ex. 2034.

C. Technology Overview & the '538 Patent

The '538 patent relates to “a process to improve fault detection reliability through feedback” in semiconductor manufacturing. Ex. 1001, 1:9–12. By way of background, the '538 patent explains that a processing system may use metrology data, acquired from particular semiconductor wafers being processed, and tool state sensor data, including tool state parameters such as pressure, humidity, and temperature, to perform fault detection in the processing of semiconductor wafers. *See id.* at 2:18–29. “Upon detecting various faults . . . , the processing system may perform a principal component analysis (‘PCA’),” which “is a multivariate technique that models the correlation structure in the data by reducing the dimensionality of the data.” *Id.* at 2:29–35. The '538 patent identifies as a problem that “the abnormal conditions detected by performing the PCA may be statistically different from the data that may have been used to build the fault detection or the PCA model.” *Id.* at 2:52–55. This can lead to inefficient false positives in fault detection. *Id.* at 3:3–4. For example, a fault detection or PCA model developed within small constraints for a particular parameter, such as pressure, would lead to a false fault indication if larger variations in pressure during the actual processing did not result in a negative impact on the processed material. *Id.* at 2:60–67.

Although the '538 patent acknowledges the development of PCA

weighting schemes to address the false positive problem, the patent notes that a shortcoming of these schemes is “that prior knowledge is required to assign a predetermined weight to a particular parameter.” *Id.* at 3:5–11. Accordingly, the ’538 patent introduces a scheme where “various parameters that may be used in a fault detection model and/or PCA model may be automatically determined and the weighting of the parameters may be adjusted dynamically.” *Id.* at 5:35–39. After identifying a fault, the processing system receives an input indicating whether the fault was significant, and based on the indication, updates a weighting fault matrix containing “data correlating various tool state parameters to particular wafers.” *Id.* at 5:39–45. Modifications to the matrix may “make the detection of similar faults more likely, or alternatively, less likely.” *Id.* at 5:45–46.

Figure 7 (reproduced below) is a flowchart illustrating an embodiment of the ’538 patent. *Id.* at 4:63–65.

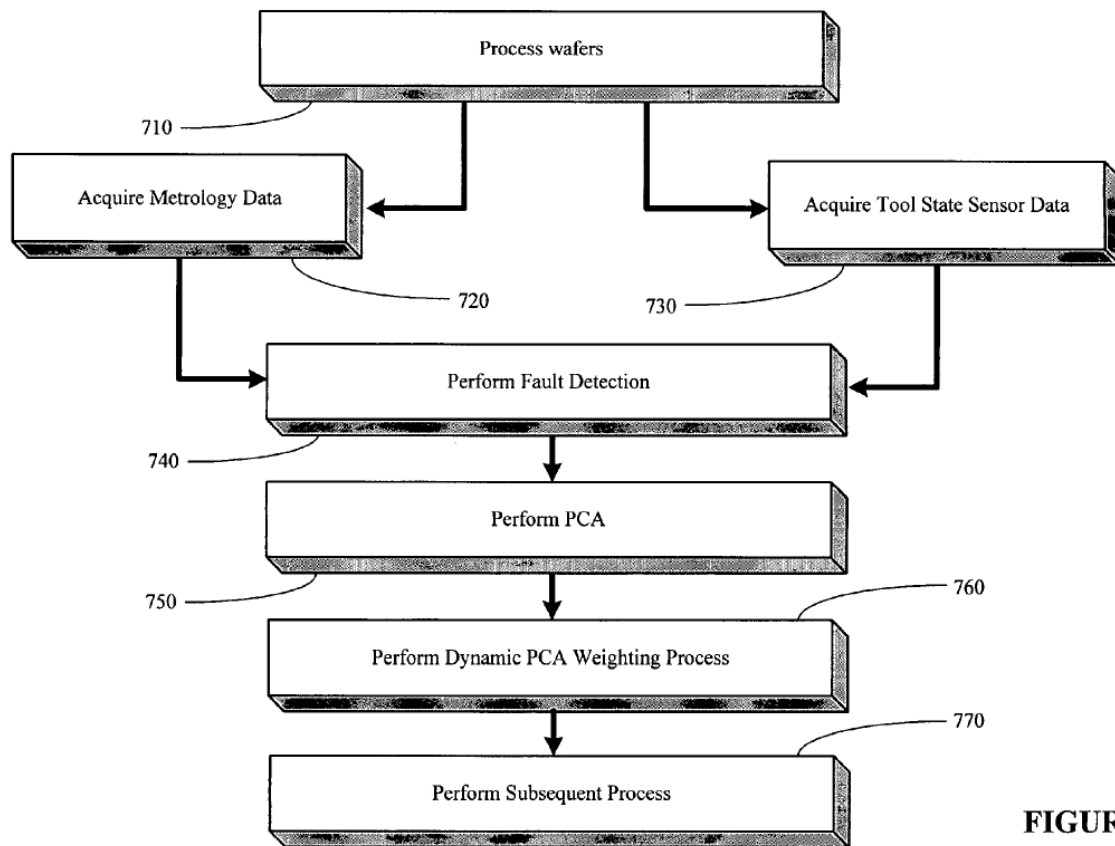


FIGURE 7

As shown above, Figure 7 depicts a process where a processing system acquires metrology data and tool state sensor data in steps 720 and 730 while processing semiconductor wafers. *Id.* at 10:49–55. The system performs fault detection based on the acquired data in step 740, and may also execute a PCA algorithm in step 750, “to detect any abnormalities or faults associated with the processing of semiconductor wafers.” *Id.* at 10:56–61. Next, the system may perform a PCA-weighting process in step 760 that may result in “various adjustments to the weighting of particular parameters . . . to more accurately assess any faults associated with processing of semiconductor wafers.” *Id.* at 10:63–11:6. The system may then perform subsequent processing of semiconductor wafers based on the adjusted

parameters for more accurate assessments of faults or abnormalities. *Id.* at 11:7–10.

D. Challenged Claims

The '538 patent includes thirty-one claims. Of those, claims 1–16, 18–26, and 28–31 are challenged here. Pet. 17–18. Of the challenged claims, claims 1 and 18 are independent. Claim 1 is illustrative of the challenged claims and reads as follows:

1. A method, comprising:

performing in a computer a fault detection analysis relating to processing of a workpiece;

determining in a said computer a relationship of a parameter relating to said fault detection analysis to a detected fault;

adjusting in said computer a weighting of said parameter based upon said relationship of said parameter to said detected fault; and

performing in said computer the fault detection analysis relating to processing of a subsequent workpiece using said adjusted weighting.

Ex. 1001, 13:28–39.

II. ANALYSIS

A. Principles of Law

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review

petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)).

“A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. Inc. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987). Moreover, “[b]ecause the hallmark of anticipation is prior invention, the prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). Whether a reference anticipates is assessed from the perspective of an ordinarily skilled artisan. *See Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368 (Fed. Cir. 2003).

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which that subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective indicia of

nonobviousness when presented.⁶ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. Person of Ordinary Skill in the Art (“POSA”)

In determining the level of skill in the art, we consider the problems encountered in the art, the art’s solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986).

Petitioner contends:

A POSA would have at least a B.S. in mechanical engineering, electrical engineering, materials science engineering, or a related field, and four years of experience working with semiconductor fabrication processes, including computer programming and data analysis.

Pet. 20 (citing Ex. 1003 ¶ 32). Patent Owner does not dispute Petitioner’s proposed level of skill in the art, proposing only to add that “additional education can compensate for less work experience and vice versa.” PO Resp. 16.

Petitioner’s proposal is generally consistent with the level of skill reflected in the specification and the cited prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that specific findings regarding ordinary skill level are not required “where the prior art itself reflects an appropriate level and a need for testimony is not shown”)

⁶ Patent Owner does not present objective indicia of nonobviousness in this case. *See generally*, PO Resp.

(quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985)). And we agree with Patent Owner that “additional education can compensate for less work experience and vice versa.” Accordingly, we adopt Petitioner’s proposed definition of the POSA level with the additional clarification proposed by Patent Owner.

C. Claim Construction

We interpret a claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b) (2020). Under this standard, we construe the claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.*

Petitioner does not identify any claim terms that require construction. Pet. 18. Patent Owner does not dispute Petitioner’s assertion that no claim terms require construction. PO Resp. 16–17.

We do not find it necessary to construe the claims in order to resolve this case. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))); *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only be construed ‘to the extent necessary to resolve the controversy’”).

D. Anticipation by Brcka

Petitioner asserts that claims 1, 2, 6, 9–13, 18, 19, 21–23, 28, and 29 are anticipated by Brcka. Pet. 30–44. Patent Owner disagrees, arguing, *inter alia*, that Brcka does not disclose any of the elements recited in independent claim 1. PO Resp. 17–30. For the reasons discussed below, we find that Petitioner has established by a preponderance of the evidence that Brcka anticipates claims 1, 2, 6, 9–13, 18, 19, 21–23, 28, and 29 of the ’538 patent.

1. Overview of Brcka (Exhibit 1005)

Brcka is a U.S. Patent Publication, entitled “Intelligent System for Detection of Process Status, Process Fault, and Preventative Maintenance.” Ex. 1005, code (54). Brcka relates to “an intelligent modeling method and system [for] monitor[ing] and perform[ing] analysis of semiconductor processing equipment.” *Id.* at code (57). Brcka notes that semiconductor processing involves the control of various process variables where changes in processing conditions, for example, “in the composition or pressure of a processing gas, applied power, or wafer temperature,” can result in semiconductor wafers being out of tolerance. *Id.* ¶ 3.

Figure 1 of Brcka (reproduced below) is a block diagram of Brcka’s reinforcement learning system. *Id.* ¶ 8.

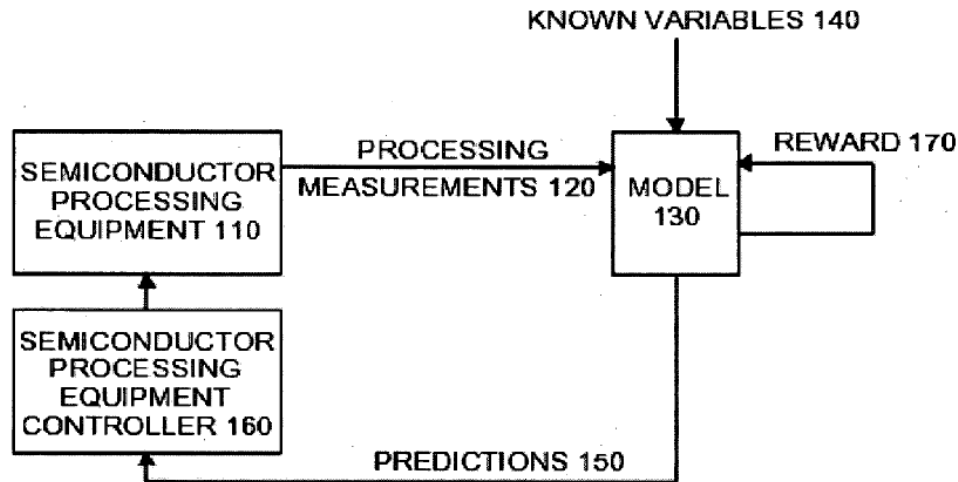


FIG. 1

Figure 1 depicts semiconductor processing equipment 110, which outputs various process measurements 120, for example, “chamber temperature, gas mixture and applied Radio Frequency (RF) power,” for use in model 130. *Id.* ¶ 14. Based on process measurements 120 and other known variables 140, such as the “the time between a last equipment cleaning interval” and “[the] time between last equipment failures,” model 130 “simulates the future equipment states to determine the next time that equipment maintenance should be necessary.” *Id.* Model 130 also can generate predictions 150 about future processing equipment states and send these to equipment controller 160. *Id.*

Brcka describes that in one embodiment, “process measurements 120 may be used in an intelligent system, such as a neural network building a model to output data indicating a prediction of a next failure time and a preventative maintenance schedule.” *Id.* at ¶ 19. Brcka observes that neural networks learn by “modifying the weight values associated with the

interconnecting paths of the network so that an input pattern maps to a pre-determined or ‘desired’ output pattern.” *Id.* ¶ 21. In the context of Brcka’s Figure 1 embodiment, the system may learn by comparing, for example, in equipment controller 160, predicted values with actual values and assigning reward value 170 by model 130. *Id.* ¶ 30.

Figure 4 of Brcka (reproduced below) “is a flow diagram demonstrating operation of a learning system and neural network model.” *Id.* ¶ 44.

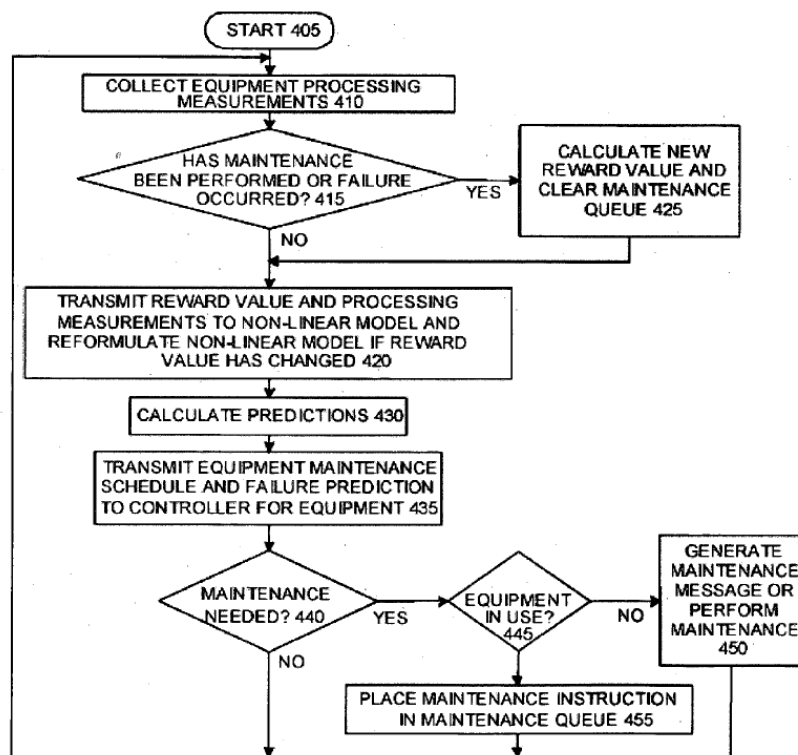


FIG. 4

Figure 4 depicts the operation of Brcka’s learning system as beginning with the collection of equipment processing measurements in step 410. *Id.* Step 415 determines “whether maintenance has been performed or a machine failure has occurred.” *Id.* If so, control passes to step 425 where

“a new reward value is calculated based on maintenance performed or the failure.” *Id.* Proceeding to step 420, if a reward value has been recalculated in step 425, the reward value and processing measurements are sent to a non-linear model, such as a neural network. *Id.* ¶ 45. At step 430, predictions are calculated based on the non-linear model, and a maintenance schedule and failure prediction is sent to a controller. *Id.* Then, maintenance is performed if needed based on the predictions, and control returns to step 410 for further collection of processing measurements. *Id.* ¶ 46.

2. Analysis of independent claim 1

a) *“performing in a computer a fault detection analysis relating to processing of a workpiece”*

Claim 1 recites as the first step in its recited method, “performing in a computer a fault detection analysis relating to processing of a workpiece.” Ex. 1001, 13:29–30.⁷ Petitioner contends that Brcka discloses this limitation. Pet. 32–33. We agree.

Brcka is directed to a method for use in facilities that process semiconductor wafer workpieces. Ex. 1005 ¶¶ 2–3. Brcka performs a fault detection analysis relating to these workpieces. Ex. 1005, title, ¶ 47; Ex. 1003 ¶ 72. For example, in the embodiment of Figure 4, step 440 determines whether tool maintenance is needed, and step 415 determines

⁷ We understand “workpiece” to include, for example, semiconductor wafers. *Id.*; Ex. 1001, 5:29–30 (“workpieces (e.g., semiconductor wafers 105, semiconductor devices, etc.)”).

whether a machine failure has occurred. Ex. 1005 ¶¶ 44, 45, Fig. 4; Ex. 1003 ¶ 72. Brcka's method uses a neural network to create a fault detection model that is performed in a computer. Ex. 1005 ¶¶ 4, 44; Ex. 1003 ¶¶ 72–73.

We find that Brcka discloses “performing in a computer a fault detection analysis relating to processing of a workpiece,” as recited in claim 1. We address Patent Owner's arguments relating to this limitation below.

Patent Owner argues that “the focus of Brcka is maintenance prediction, not fault detection.” PO Resp. 17. According to Patent Owner “Brcka does not teach the performance of an analysis of a failure which has already occurred, but rather predicts, or speculates as to the occurrence of, the time of an equipment failure or next equipment maintenance which might or might not happen in the future.” *Id.* at 18. Patent Owner argues that “[b]ecause Brcka's neural network is not analyzing detected faults but rather is predicting the time of future failures or the next equipment maintenance, Brcka does not teach or suggest the claimed fault detection analysis of the [']538 patent claims.” *Id.* at 19. More specifically, Patent Owner explains that Brcka uses “training and testing data” to build a model that predicts the next failure time and generates a preventative maintenance schedule. *Id.* (citing Ex. 1005 ¶ 19). According to Patent Owner predicting a failure based on modeling training and testing data is different from analyzing a detected fault. *Id.* (“The time of a next failure is **not** the result of a fault detection analysis but is the result of ‘training and testing data.’ Also, when a failure will occur, as opposed to the actual failure itself, is not a

‘fault.’”). Thus, Patent Owner argues that Brcka does not teach “performing in a computer a fault detection analysis relating to processing of a workpiece,” as recited in claim 1. *Id.* at 17–35. We disagree.

Petitioner cites to the embodiment depicted in Brcka’s Figure 4 as illustrating Brcka’s “fault detection analysis.” Pet. 32–33; *see also* Ex. 1003 ¶¶ 72–73. Figure 4 is a “flow diagram demonstrating operation of a learning system and [a] neural network model designed in accordance with at least one embodiment of [Brcka’s] invention.” Ex. 1005 ¶ 44. In step 415 of the operation disclosed in Figure 4, “a determination is made whether maintenance has been performed or a machine failure has occurred.” *Id.* ¶ 44, Fig. 4. If either of these things has happened, “a new reward value is calculated.” *Id.* In step 440, “a determination is made whether maintenance is needed.” *Id.* ¶ 45, Fig. 4. Thus, Brcka determines whether a failure has occurred, accounts for this determination by assigning a “reward value” (Fig. 4, step 425), and then decides whether maintenance is needed. On this record, the analysis reflected in these steps qualifies as a “fault detection analysis.”

We recognize that Brcka’s fault detection analysis is used in a method that includes a predictive component. But, we do not find anything in the language of claim 1 that precludes performing the fault detection analysis as part of a predictive model. Indeed, the claim language requires only “performing . . . a fault detection analysis.” Moreover, the “fault detection” itself (i.e., Brcka’s step 415), as opposed to the analysis of the detected fault, is backward-looking, not predictive; it determines “whether . . . a machine failure *has occurred*.” *Id.* ¶ 44 (emphasis added).

Patent Owner argues that Brcka “focus[es] exclusively on monitoring *faults directly associated with equipment parameters for scheduling preventative maintenance*—maintenance that would occur outside of the normal operation of the equipment.” PO Resp. 20. According to Patent Owner, this is significant because “a machine *failure* as described in Brcka and a *fault* relating to a workpiece, as explicitly claimed in the ’538 patent, are *not the same*.” *Id.* at 21. Patent Owner further argues that Petitioner reads the requirement for a “fault detection analysis *relating to processing of a workpiece*” out of claim 1, explaining that a “machine failure can occur without impacting the workpiece under processing” and that “it is neither inherent nor anticipatory that a machine failure leads to a workpiece fault.” Sur-reply 6–7; *see also id.* at 5 (“Petitioner still fails to show that Brcka teaches an FDA based on *product performance data*.”), 6 (“*Petitioner is unable to show . . . that Brcka collects workpiece performance data for use in an FDA*.”). We disagree.

Claim 1 does not require detecting a workpiece fault, as Patent Owner’s argument suggests. Rather, claim 1 requires “performing . . . a fault detection analysis relating to processing of a workpiece.” Ex. 1001, 13:29–30. Brcka’s step 415 determines whether a “machine failure” has occurred. Ex. 1005 ¶ 44, Fig. 4. Brcka describes the process in which the determination of a machine failure occurs as part of “a mathematical model of the relationship of parameters to results in a given semiconductor manufacture process.” Ex. 1005 ¶ 15, *see also id.* ¶ 2 (“The present invention relates to control systems, particularly to a system in a semiconductor processing facility designed to monitor performance, predict

failures and determine maintenance schedules.”). Accordingly, the machine failure detected in Brcka’s step 415 “relates” to “processing of a workpiece” as required by claim 1. Patent Owner’s argument that Brcka’s tool failure determination does not relate to the processing of a workpiece makes little sense because it would require finding that Brcka’s tool failure determination somehow does not relate to the processing of the thing the tool is making.

Finding that Brcka’s tool failure determination is related to the processing of a workpiece is consistent with the fault detection analysis described in the ’538 patent. Ex. 1001, 3:39–43 (“The method comprises processing a workpiece and performing a fault detection analysis relating to the processing of the workpiece based upon a tool state parameter being input into a fault detection model associated with the fault detection analysis.”). In addition, we note that at least one of the parameters used in Brcka’s mathematical model relates directly to the semiconductor wafer – i.e., the workpiece – rather than to the machinery used to produce that workpiece. *Id.* ¶ 40 (Brcka teaching that its model collects “critical dimension measurement” data); Ex. 1003 ¶ 101 (Dr. Shanfield’s testimony that “critical dimensions would be considered metrology data,” and that “[i]n semiconductor fabrication, metrology data refers to product measurements rather than tool measurements.”).

Patent Owner argues that “[b]y definition, tool maintenance is performed during *non-productive* times, i.e., idle times, between processing steps or operations.” PO Resp. 22. According to Patent Owner Brcka’s “tool-specific failures . . . are all directed to optimizing when maintenance

should occur and do **not** relate to any real-time optimization during processing.” *Id.* at 22–23. Patent Owner contrasts this with “[t]he claimed ’538 methodology,” which “concerns continuous changes in fault detection **during** wafer processing.” *Id.* at 22. Patent Owner argues that the POSA “would have understood that the claimed ’538 system and methodology claims performing real time, dynamic process adjustments” and that “Brcka does not teach any such analysis of failures (or faults) that would allow for real time or in situ process adjustments.” *Id.* at 23.

Patent Owner’s argument is not persuasive because the claims do not require real time process adjustments. Claim 1 recites adjusting a weighting of fault detection analysis parameters based on the relationship of the parameters to the detected fault and using the adjusted weighting in the “fault detection analysis relating to processing of a subsequent workpiece.” Ex. 1001, 13:37–39. It does not, however, require process adjustments beyond adjusting parameter weighting. *Id.* at 13:28–39. And, although the specification of the ’538 patent contemplates making process adjustments, it places no restriction as to the timing of such adjustments. *Id.* at 12:28–51 (explaining that the system may dynamically adjust the weighting of factors relating to faults, providing “a more accurate assessment of the condition of processing tools,” but not limiting when “process adjustment[s]” may be performed). Accordingly, we do not find in the ’538 patent support for the argument that the POSA would have understood claim 1 to require “real time, dynamic process adjustments.” PO Resp. 23.

In its Sur-reply, Patent Owner argues that “Petitioner improperly mixes faults and failure in an effort to mischaracterize the prior art.”

Sur-reply 1. Patent Owner argues that Petitioner's expert distinguished between faults and failures, stating that a "fault is an abnormal tool condition" and a "failure . . . is the termination of the ability to perform a required function." *Id.* at 1–2. Petitioner argues that this is a new claim construction argument (Mot. 1), but in view of Patent Owner's representations that it does not seek to a construction of any claim terms (Mot. Opp. 4), we do not interpret it as such. In any event, we do not find this argument persuasive.

The implicit premise of Patent Owner's argument is that Brcka discloses only failures and thus does not disclose "fault detection." However, we credit the testimony of Dr. Shanfield that "[g]enerally you always need a fault to have a failure occur. So when there is a failure, a fault has occurred." Ex. 2003, 74:6–11; *see also* Ex. 1003 ¶ 37 ("A fault is an abnormal tool condition, such as when a parameter strays beyond its acceptable boundary. Faults may lead to failure, which is the 'termination of the ability of an item to perform a required function.'") (internal citation omitted), 81 ("Machine failure, though, means that a fault condition existed requiring termination of the machine function upon the wafer."). Thus, Brcka's disclosure of analyzing machine failures is also, necessarily, a disclosure of a analyzing a fault.

Accordingly, we find that Petitioner has established, by a preponderance of the evidence, that Brcka discloses "performing in a computer a fault detection analysis relating to processing of a workpiece."

- b) *“determining in a said computer a relationship of a parameter to relating to said fault detection analysis to a detected fault”*

Claim 1 recites as the second step in its recited method, “determining in a said computer a relationship of a parameter relating to said fault detection analysis to a detected fault.” Ex. 1001, 13:31–33. Petitioner contends that Brcka discloses this limitation. Pet. 33–35. We agree.

Brcka discloses collecting “processing measurements” of parameters like pressure, flow rate, and temperature, as well as fault measurements, *e.g.*, machine “maintenance and/or failure times.” Ex. 1005 ¶¶ 40, 41; Ex. 1003 ¶ 76. As Dr. Shanfield explains, Brcka uses these values to train a neural network to “determine the relationships between the process measurements as input and the maintenance and/or failure times as output.” Ex. 1003 ¶ 76 (citing Ex. 1005 ¶¶ 41–42, Fig. 3;). Brcka’s neural network “recreat[es] in a computer a real neural network” that is capable of “learning” by “modifying the weight values associated with the interconnecting paths of the network so that an input pattern maps to a pre-determined or ‘desired’ output pattern.” Ex. 1005 ¶¶ 4, 21; Ex. 1003 ¶ 73.

We find that Brcka discloses “determining in a said computer a relationship of a parameter relating to said fault detection analysis to a detected fault,” as recited in claim 1. We address Patent Owner’s arguments relating to this limitation below.

Patent Owner argues that Brcka does not teach “determining in a said computer a relationship of a parameter relating to said fault detection analysis to a detected fault,” as recited in claim 1. PO Resp. 25–26. Patent Owner acknowledges that Brcka discloses collecting measurements of

“parameters like pressure, flow rate, and temperature,” but argues that these measurements are mere “historical processing measurements” that are “collected by the neural network for building the ‘non-linear model.’” *Id.* at 26. According to Patent Owner, these parameters are not “tied to a detected fault” and thus, Brcka does not “determine a relationship of a parameter relating to the fault detection analysis to a detected fault.” *Id.*; *see also* Sur-reply 9 (“Petitioner does not adequately explain . . . how Figure 5 of Brcka shows in any way that its neural network determines the relationship between parameters and detected faults”). Patent Owner also argues that Brcka does not “determine a relationship of a parameter relating to the fault detection analysis to a detected fault because, in Brcka, “[m]aintenance and/or failure times’ . . . are **not** parameters collected for fault detection purposes, but rather outputs (i.e., results) of a prediction analysis performed by the neural network.” PO Resp., 26. We do not find this argument persuasive.

Brcka discloses a neural network that “store[s] connected strengths (i.e., weight values) between . . . artificial neuron units.” Ex. 1005 ¶ 21. “[A] set of [weight] values associated with each connection in the neural network, is used to map an input pattern to an output pattern.” *Id.* “‘Learning’ in a neural network means modifying the weight values associated with the interconnecting paths of the network so that an input pattern maps to a pre-determined or ‘desired’ output pattern.” *Id.* Brcka discloses that “processing measurements are used as inputs [in the neural network] and the maintenance and/or failure times are used as outputs for

training the neural network.” *Id.* ¶ 41; *see also id.* ¶ 40 (identifying various “processing measurements”).

We are not persuaded by Patent Owner’s argument that failure times are not parameters used for fault detection analysis because Brcka makes clear that both inputs and outputs are used to train the neural network. *Id.* ¶¶ 21, 41, Fig. 3. Accordingly, all inputs and outputs, including the fault detection parameter, are interconnected. *Id.* Adjusting the weight of one parameter necessarily involves determining a relationship between that parameter and the other parameters. *Id.*; *see also id.* at Fig. 4, ¶¶ 44–45.

One parameter sent to the neural network is the determination whether a machine failure has occurred. *Id.* at Fig. 4, element 415, ¶ 44 (“Control then proceeds to 415, at which a determination is made whether maintenance has been performed or a machine failure has occurred.”). A “machine failure” is a detected fault. Ex. 1003 ¶ 37 (Dr. Shanfield’s testimony that “[a] fault is an abnormal tool condition, such as when a parameter strays beyond its acceptable boundary”); Tr. 21–22 (“[Board]: Counsel, do you contend that the detected fault has to be in the wafer -- [Patent Owner’s Counsel]: No. [Board]: -- as opposed to, for example, a tool? [Patent Owner’s Counsel]: No. It could be a detected fault in the tool. That’s correct.”); Ex. 1046 at 16:11–18:16 (testimony of Mr. Humphrey that fault detection is “anywhere from actual tool or equipment parameters to process additions, metrology measurements on wafers . . . all in the context of semiconductor manufacturing of course”); *see also, supra* § II.D.2.a (discussing evidence that failures are necessarily faults).

Brcka makes clear that machine failures are used to train the neural network. Ex. 1005 ¶ 41 (“the maintenance and/or failure times are used as outputs for training the neural network”). If a machine failure is detected in Brcka’s method, a new reward value is calculated. *Id.* at Fig. 4, ¶¶ 44–45 (explaining that if a machine failure is detected “a new reward value is calculated based on . . . the failure” and that if a new reward value is calculated “the nonlinear model is reformulated”). Thus, Brcka’s neural network determines a relationship between parameters and detected faults.

Accordingly, we find that Petitioner has established, by a preponderance of the evidence, that Brcka discloses “determining in a said computer a relationship of a parameter relating to said fault detection analysis to a detected fault.”

c) *“adjusting in said computer a weighting of said parameter based upon said relationship of said parameter to said detected fault”*

Claim 1 recites as the third step in its recited method, “adjusting in said computer a weighting of said parameter based upon said relationship of said parameter to said detected fault.” Ex. 1001, 13:34–36. Petitioner contends that Brcka discloses this limitation. Pet. 35–37. We agree.

Petitioner contends, and we agree, that “Brcka discloses that its neural network model uses ‘weight values’ to map process measurements (*i.e.*, parameters) to fault measurements (*e.g.*, maintenance and/or failure times).” Pet. 35 (citing Ex. 1005 ¶¶ 21, 41; Ex. 1003 ¶¶ 77, 85. We also agree with Petitioner that, “Brcka describes how these weight values are ‘associated with each connection in the neural network’ and referred to as the

‘knowledge structure’ of the neural network.” *Id.* (citing Ex. 1005 ¶ 21, Fig. 3; Ex. 1003 ¶¶ 85–86). Brcka adjusts these weigh values when a fault is detected. For example, step 415 in Figure 4, determines whether a machine failure has occurred. Ex. 1005, Fig. 4, ¶ 44. If a machine failure is detected, Brcka’s method calculates a reward value which is used to reformulate the neural network. Ex. 1005 ¶¶ 32, 43–44; Ex. 1003 ¶¶ 82–83. This facilitates “learning” within the neural network, which Brcka defines as a “self-directed change in a knowledge structure that improves performance.” Ex. 1005 ¶ 21; Ex. 1003 ¶ 86. Brcka relies on “learning procedures for weight adjustment . . . derived from the learning rule of psychoanalyst D. O. Hebb, which states that if a unit, u_j , receives an input from another unit, u_i , and both are highly active, the weight, w_{ji} , in the connection from u_i to u_j should be strengthened.” Ex. 1005 ¶¶ 23–24; Ex. 1003 ¶ 87. Thus, we agree with Dr. Shanfield that Brcka discloses “adjusting weight values to refine the neural network model to better reflect the effects of input measurements (i.e., parameters) on maintenance scheduling on failure times (i.e., faults).” Ex. 1003 ¶ 88, *see also id.* ¶¶ 85–87.

We find that Brcka discloses “adjusting in said computer a weighting of said parameter based upon said relationship of said parameter to said detected fault,” as recited in claim 1. We address Patent Owner’s arguments relating to this limitation below.

Patent Owner argues that Brcka does not teach “adjusting in said computer a weighting of said parameter based upon said relationship of said parameter to said detected fault,” as recited in claim 1. PO Resp. 27–29. More specifically, Patent Owner contends that the weight values disclosed in

Brcka “are not adjusted based on a relationship between any of the purported ‘parameters’ and a detected fault.” *Id.* at 27. Rather, according to Patent Owner, “the weight adjustment happens [when] there is a mismatch between the actual output pattern and the desired output pattern.” *Id.* at 27–28.

Brcka discloses that when a “machine failure” has occurred, a reward value is calculated. Ex. 1005, Fig. 4, ¶¶ 43, 44. A reward value “may be as simple as the sum of the difference from the predicted maintenance/failure times to the actual maintenance/failure times.” *Id.* ¶ 43. If the reward value was recalculated, then the neural network is reformulated. *Id.* ¶ 45, Fig. 4; *see also*, Ex. 1003 ¶ 84. Brcka discloses that when “the actual output pattern does not match the desired output pattern, a learning rule is invoked by the neural network system to adjust the weight value associated with each connection of the network.” Ex. 1005 ¶ 23. As discussed *supra* § II.D.2.a, all of Brcka’s inputs and outputs, including the fault detection parameter, are interconnected. Thus, calculating a new reward value at Brcka’s step 425 when actual machine failure output does not match desired machine failure output would cause an adjustment to the weighting of each parameter in the neural network based on the relationship of those parameters to the detected failure. *Id.* ¶¶ 23, 43–45, Fig. 4. Patent Owner’s argument that this position is “logically flawed as it essentially equates neural network outputs in Brcka to FDA inputs in the ’548 patent” (Sur-reply 10) is not persuasive because it is not grounded in the language of claim 1.

Patent Owner argues that “instead of basing on some relationship between the purported parameters and a detected fault (and there is none), the weight adjustment in Brcka happens as long as there is a mismatch

between the actual output pattern and the desired output pattern.” PO Resp. 27–28. Further, Patent Owner contends that the outputs in Brcka “are not detected faults,” but instead the outputs include “suggested maintenance schedules.” *Id.* at 28. Finally, Patent Owner argues that “[a]t the time of the ‘teaching phase,’ no fault has been detected because the model is not yet trained to detect such a fault.” *Id.*

We do not find these arguments persuasive. We agree with Petitioner that a “mismatch between actual output pattern and the desired output pattern” would include, in the case of a “machine failure” – i.e., a detected fault – calculation of a new reward value. Pet. Reply 15–16. As discussed above, we find that the Brcka method adjusts the weights of each parameter in the neural network when it calculates a new reward value. Ex. 1005 ¶¶ 21, 23, 41, 43–45, Figs. 3–4. Accordingly, we do not agree with Patent Owner that Brcka’s teaching phase does not involve adjusting the weight of parameters based on a detected fault.

In addition, we agree with Petitioner that Patent Owner’s argument that “no fault has been detected” “[a]t the time of the ‘teaching phase,’” rests on the incorrect premise that the “teaching phase” in Brcka is limited to an untrained neural network. Reply 15. Brcka’s method is a continuous loop. Thus, in step 420 of the method depicted in Figure 4, if the non-linear model is reformulated in response to a new reward value calculated based on a machine failure, the reformulated model will carry over when the method cycles back to step 410. Ex. 1005 ¶ 46. Patent Owner contends that Figure 4 of Brcka does not depict a continuous loop but rather discloses a method in which, after one of the three concluding steps (440, 450, and 455)

is performed, the non-linear model resets to its initial state. Tr. 29–36; Sur-reply 11 (“Figure 4 merely shows that, at the conclusion of a cycle, either maintenance is not needed or some maintenance task is carried out. ***The actual result of any previous cycle is inconsequential with respect to the equipment processing measurements next collected by the neural network at Step 410.***”). We do not agree with this interpretation of Brcka’s Figure 4. Rather we credit the testimony of Dr. Shanfield that the “Brcka method repeats in a loop as the machinery processes additional wafers to facilitate continuous learning by the system model.” Ex. 1003 ¶ 66.

Dr. Shanfield’s testimony is consistent with what is depicted in Figure 4. Specifically, in steps 440, 450, and 455 the method determines whether “maintenance [is] needed” (step 440), and, if maintenance is needed “place[s] maintenance instruction in [the] maintenance queue” (step 455) or “generate[s] maintenance message or perform[s] maintenance” (step 450). Ex. 1005, Fig. 4. After performing one or more of these steps, the method returns to step 415 where it determines “has maintenance been performed.” *Id.* Thus, step 415 determines whether actions were taken in response to step 450, suggesting a continuous loop. *Id.* Similarly, step 425 includes the step of “clear[ing] maintenance queue,” which suggests a continuous loop because step 455 “place[s] maintenance instruction in [the] maintenance queue.” *Id.* Dr. Shanfield’s testimony is also consistent with Brcka’s teachings that its neural network model may be “setup for continuous training,” that its method includes “dynamic modeling . . . in near real-time,” and that in the method depicted in Figure 4, control returns to step 410 after performance of steps 445, 450, and/or 455. Ex. 1003 ¶¶ 18, 42, 43, 46.

Finally, we note that Patent Owner does not direct us to any teaching in Brcka that the reformulated non-linear model described in step 420 reverts to the original model after the completion of steps 440, 450, and/or 455. For this additional reason, we do not agree with Patent Owner that “no fault has been detected” at the “time of the ‘teaching phase.’” PO Resp. 28.

Patent Owner argues that “the ’538 patent refers to differentiating between a detected fault versus a significant fault *prior to weighting*” while “Brcka teaches that all detected faults are significant, just that some parameters contributing to the detected fault are more significant than others.” *Id.* Thus, according to Patent Owner, “the disclosure in Brcka teaches away from the claimed invention of the ’538 patent since the claimed ’538 patent’s invention is drawn to the idea that all detected faults are *not* significant, and only those parameters associated with *significant* faults need to be considered for weighting.” *Id.* We do not find this persuasive because Patent Owner does not tie this argument to language in the claim. Simply put, claim 1 does not require distinguishing between a detected fault and a significant fault prior to weighting.

Accordingly, we find that Petitioner has established, by a preponderance of the evidence, that Brcka discloses “adjusting in said computer a weighting of said parameter based upon said relationship of said parameter to said detected fault.”

- d) *“performing in said computer the fault detection analysis relating to processing of a subsequent workpiece using said adjusted weighting”*

Claim 1 recites as the fourth and final step in its recited method, “performing in said computer the fault detection analysis relating to processing of a subsequent workpiece using said adjusted weighting.”

Ex. 1001, 13:37–39. Petitioner contends that Brcka discloses this limitation. Pet. 37–39. We agree.

Brcka discloses a method that repeats in a continuous loop. As Petitioner explains, “Brcka discloses that the neural network model may be ‘updated using the method illustrated in Fig. 4[,]’” and “[t]he final step of the method in Fig. 4 is to return to the starting point and repeat the method processing in additional workpieces.” Pet. 37 (citing Ex. 1005 ¶¶ 46, 50; Ex. 1003 ¶ 90). We agree with Petitioner, that Brcka’s “cycle continues in an endless loop so that the neural network may continuously learn about the manufacturing system that it models.” *Id.* at 38 (citing Ex. 1005 ¶¶ 42–46; Ex. 1003 ¶¶ 90, 91).

We find that Brcka discloses “performing in said computer the fault detection analysis relating to processing of a subsequent workpiece using said adjusted weighting,” as recited in claim 1. We address Patent Owner’s arguments relating to this limitation below.

Patent Owner argues that Brcka does not teach “performing in said computer the fault detection analysis relating to processing of a subsequent workpiece using said adjusted weighting,” as recited in claim 1. PO Resp. 29–30. According to Patent Owner, “[t]here [are] no disclosures in Brcka that describe the use of weighted values, or desired output pattern, in the

performance of a fault detection analysis on a subsequent wafer.” *Id.* at 39.

We do not find this argument persuasive because, as discussed *supra* § II.D.2.c, Brcka discloses continuous training of its neural network as reflected in Figure 4, which is, on its face, a continuous loop. Ex. 1005, Fig. 4; *see also, id.* ¶¶ 42 (disclosing continuous training), 43 (same), 46 (explaining that, in the method depicted in Figure 4, control returns to step 410 after steps 450 and 455 or if it is determined that maintenance is not needed).

Accordingly, we find that Petitioner has established, by a preponderance of the evidence, that Brcka discloses “performing in said computer the fault detection analysis relating to processing of a subsequent workpiece using said adjusted weighting.”

e) Conclusion with respect to claim 1

For the reasons discussed above, we find that Petitioner has carried its burden to establish, by a preponderance of the evidence, that Brcka discloses each of the limitations of claim 1. Accordingly, we find that Brcka anticipates claim 1.

3. Analysis of independent claim 18

Claim 18 is very similar to claim 1, with the principal difference being that the preamble of claim 1 recites only “[a] method” while the preamble of claim 18 recites “[a] non-transitory computer readable program storage device encoded with instruction that, when executed by a computer, performs a method.” Ex. 1001, 13:28–39, 14:63–15:7. The method steps recited in claim 1 are substantially the same as the steps that the computer is

recited as performing in claim 18. *Id.* Petitioner's proof for claim 1 is substantially the same as its proof for claim 18 and Patent Owner relies on the same arguments it presented with respect to claim 1 to support the patentability of claim 18. Pet. 30–39 (presenting proof for claim 1 together with proof for claim 18); PO Resp. 17–30 (arguing patentability based on limitations common to claim 1 and 18). Accordingly, for the reasons discussed with respect to claim 1, we find that Petitioner has established, by a preponderance of the evidence, that Brcka discloses all of the limitations of claim 18.

4. Analysis of dependent claims 2, 6, 9–13, 19, 21–23, 28, and 29

Petitioner contends that Brcka discloses or renders obvious each element of claims 2, 6, 9–13, 19, 21–23, 28, and 29, and sets forth an element-by-element comparison of the asserted art to the challenged claims. Pet. 39–44. Beyond challenging Petitioner's showing with respect to claim limitations common to claims 1 and 18, Patent Owner does not challenge any aspect of Petitioner's showing with respect to claims 2, 6, 9–13, 19, 21–23, 28, and 29. Having reviewed the argument and evidence of record, we find that Petitioner has shown by a preponderance of the evidence that claims 2, 6, 9–13, 19, 21–23, 28, and 29 are anticipated by Brcka.

E. Obviousness over Brcka

Petitioner asserts that claims 3–5, 7, 8, 14–16, 20, 24–26, 30, and 31 would have been obvious over Brcka. Pet. 44–56. Petitioner provides

documentary and testimonial evidence to back its assertions. *Id.*; *see also* Ex. 1003 ¶¶ 108–142. Patent Owner argues that claims 3–5, 7, 8, 14–16, 20, 24–26, 30, and 31 are not rendered obvious by Brcka because of the alleged shortcomings of Brcka with respect to the claims challenged as being anticipated, and because Petitioner has not asserted that the knowledge of a POSA remedies these alleged shortcomings. PO Resp. 30–31. For the reasons discussed above, on the current record, we do not find these arguments persuasive.

In its Sur-reply, Patent Owner argues that Brcka does not disclose the “significant factor” limitation of claim 5.⁸ Sur-reply 11. Patent Owner contends that it raised this argument when it discussed that Brcka did not disclose detecting “significant” faults. Paper 41 (PO Opp.), 5. We do not agree because that discussion focuses on a limitation appearing in different claims (claims 1 and 18) challenged as part of a different ground (Ground 1, which does not include claim 5). PO Resp. 28. Patent Owner’s discussion of Ground 2, which includes claim 5, does not separately argue claim 5 or its “significant factor” limitation. *Id.* at 30–31. Accordingly, we determine that Patent Owner has waived its argument that Brcka does not disclose the “significant factor” limitation recited in claim 5. Paper 11 (“Patent Owner is

⁸ Claim 5 depends from claim 1 and further recites that the method comprises “designated in said computer whether said detected fault is a significant fault; and adjusting said weighting associated with said parameter based responsive to designating said detected fault as a significant fault.” Ex. 1001, 13:52–57.

cautioned that any arguments not raised in the response may be deemed waived”).

Even if we were to consider Patent Owner’s “significant factor” limitation argument, we would not find it persuasive because it does not address Petitioner’s assertion that the “significant factor” limitation would have been obvious. Petitioner asserts that it would have been obvious to “modify the method of Brcka to take special account of significant faults by adjusting the weighting associated with parameters related to such faults.” Pet. 49–50. This assertion is supported by testimonial and documentary evidence explaining why distinguishing significant faults is important and why the POSA would reasonably have expected success in modifying Brcka to take “special account” of significant faults. *Id.* (citing Ex. 1005 ¶¶ 21–22, 44–47; Ex. 1003 ¶¶ 121, 123, 125–126; Ex. 1020, 118; Ex. 1011). For the reasons set forth in the Petition and the accompanying declaration of Dr. Shanfield, we agree with Petitioner that it would have been obvious to modify Brcka’s method to take special account of significant faults. Patent Owner argues that “Petitioner is incorrect that Brcka discloses the ‘significant factor’ limitation of at least dependent claim 5.” Sur-reply 11. But this argument misses the point – i.e., that Brcka renders this limitation obvious. Accordingly, even if we were to consider Patent Owner’s untimely argument regarding claim 5, we would still find that Petitioner has carried its burden to establish that claim 5 would have been obvious.

Having reviewed the argument and evidence of record, we find that Petitioner has shown by a preponderance of the evidence that claims 3–5, 7, 8, 14–16, 20, 24–26, 30, and 31 would have been obvious over Brcka.

III. PETITIONER’S MOTION TO STRIKE

Petitioner moves to strike portions of Patent Owner’s Sur-reply as exceeding the scope permitted under 37 C.F.R. § 42.23(b), which limits sur-replies to “respond[ing] to arguments raised in the corresponding reply.” More specifically, Petitioner contends that Patent Owner makes two arguments that exceed the proper scope of a sur-reply.

First, Petitioner contends that Patent Owner presents a new claim construction argument that draws a distinction between “failures” and “faults.” More specifically, Petitioner argues that in its Response, Patent Owner argued “only about purported distinctions between ‘equipment faults’ and ‘workpiece faults,’ and between ‘prediction of the time of future failures’ and ‘a failure which has already occurred.’” Mot. 2 (internal citations omitted). Petitioner then argues that in its sur-reply, Patent Owner “argues for the first time that there is some additional distinction between disclosure of failure and disclosure of fault.” *Id.* We do not find this persuasive because we do not understand Patent Owner to be offering a construction of the term “fault” or any other claim term. Mot. Opp. 4 (“Neither Petitioner nor Patent Owner have offered—and do not now offer—terms for construction.”). Accordingly, Petitioner’s motion to strike Patent Owner’s purportedly new claim construction argument is denied.

Second, Petitioner contends that Patent Owner “disputes for the first time other aspects of the obviousness of dependent claim 5 (Ground 2) beyond the only argument previously presented in the Patent Owner Response (‘POR’) that Brcka purportedly does not disclose certain limitations of independent claims 1 and 18 (Ground 1).” Mot. 1. For the

reasons discussed *supra* § II.E, we agree with Petitioner that the arguments regarding claim 5 in Patent Owner’s Sur-reply are new. Because it was a new argument, we declined to consider it. *See supra* § II.E. In addition, we determined that even if we were to consider Patent Owner’s new argument, we would still find that claim 5 would have been obvious over Brcka. *Id.* Accordingly, we dismiss Petitioner’s request to strike Patent Owner’s new argument regarding claim 5 as moot.

IV. CONCLUSION⁹

Petitioner has established, by a preponderance of the evidence, that claims 1, 2, 6, 9–13, 18, 19, 21–23, 28, and 29 are anticipated by Brcka and that claims 3–5, 7, 8, 14–16, 20, 24–26, 30, and 31 would have been obvious over Brcka in view of the knowledge of a POSA. Petitioner’s motion to strike is denied in part and dismissed in part as moot.

In Summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1, 2, 6, 9–13,	102(e)	Brcka	1, 2, 6, 9–13, 18–19, 21–23,	

⁹ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this Decision, we draw Patent Owner’s attention to the April 2019 Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. §§ 42.8(a)(3), (b)(2).

18–19, 21–23, 28, 29			28, 29	
3–5, 7, 8, 14–16, 20, 24– 26, 30, 31	103(a)	Brcka	3–5, 7, 8, 14– 16, 20, 24–26, 30, 31	
Overall Outcome			1–16, 18–26, 28–31	

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petitioner has proved by a preponderance of the evidence that claims 1–16, 18–26, and 28–31 of U.S. Patent No. 8,676,538 B2 are unpatentable;

ORDERED that Petitioner’s motion to strike is denied in part and dismissed in part as moot;

ORDERED that parties to this proceeding seeking judicial review of this Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2021-01339
Patent 8,676,538 B2

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