

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RPX CORPORATION and ADVANCED MICRO DEVICES, INC.,
Petitioner,

v.

IYM TECHNOLOGIES LLC,
Patent Owner.

Case IPR2017-01888
Patent 7,448,012 B1

Before MICHAEL R. ZECHER, MINN CHUNG, and
CARL L. SILVERMAN, *Administrative Patent Judges*.

SILVERMAN, *Administrative Patent Judge*.

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

I. INTRODUCTION

In response to a Petition (Paper 1, “Pet.”) filed by RPX Corporation and Advanced Micro Devices, Inc., (collectively “RPX”), we instituted an *inter partes* review of claims 1–11, 13, and 14 of U.S. Patent No. 7,448,012 B1 (Ex. 1001, “the ’012 patent”). Paper 9 (“Dec. on Inst.”).

During the trial, IYM Technologies LLC (“Patent Owner”) filed a Response (Paper 17, “PO Resp.”), to which RPX filed a Reply (Paper 23, “Pet. Reply”). With our authorization, IYM filed a Sur-Reply (Paper 27, “PO Sur-Reply”). A consolidated oral hearing with related Case IPR2017-01886 was held on December 11, 2018, and a copy of the transcript was entered into the record. Paper 34 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of the claims on which we instituted trial. Based on the record before us, RPX has shown, by a preponderance of the evidence, that claims 1–9, 11, 13, and 14 of the ’012 patent are unpatentable. RPX, however, has not shown, by a preponderance of the evidence, that claim 10 of the ’012 patent is unpatentable.

A. Related Matters

The ’012 patent is involved in a district court case titled *IYM Technologies LLC v. Advanced Micro Devices, Inc.*, 1-16-cv-00649-GMS (D. Del) (the “Delaware Litigation”). Pet. vii; Paper 4, 1. In addition to this Petition, RPX filed a separate petition in Case IPR2017-01886 requesting an *inter partes* review of claims 1–14 of the ’012 patent. *Id.* A Final Written Decision for Case IPR2017-01886 is being entered concurrently.

B. The '012 Patent

The '012 patent, titled “Methods and System for Improving Integrated Circuit Layout,” issued November 4, 2008, from U.S. Patent Application No. 10/907,814, filed on April 15, 2005. Ex. 1001, [54], [45], [21], [22]. The '012 patent claims priority to the following provisional applications: (1) U.S. Provisional Application No. 60/603,758, filed on August 23, 2004; and (2) U.S. Provisional Application No. 60/564,082, filed on April 21, 2004. *Id.* at [60].

The '012 patent generally relates to integrated circuit (“IC”) manufacturing and, in particular, to a method and system for generating and optimizing the layout artwork of an IC. Ex. 1001, 1:11–13. As background, the '012 patent discloses that, in modern processing technology, the manufacturing yield of ICs (i.e., a measure of functioning devices in semiconductor testing) depends heavily on their layout construction. *Id.* at 1:17–19. For a given manufacturing process, a set of design rules are applied during chip layout in order to avoid geometry patterns that cause chip failures. *Id.* at 1:19–21. These design rules guarantee the yield by limiting layout geometry parameters, such as minimum spacing, minimal line width, etc. *Id.* at 1:21–23. Conventional layout construction systems cover the worst case scenario for all chips by applying these design rules over a wide chip area and to entire classes of circuits. *Id.* at 1:24–27.

The '012 patent discloses that, in modern processing technology, many layout features may interact during chip processing. Ex. 1001, 1:29–31. These feature-dependent interactions are difficult to capture with precise design rules and, as a result, sufficiently relaxed global design rules are implemented in order to guarantee the yield. *Id.* at 1:33–36. According to

the '012 patent, there are two drawbacks to this approach: (1) it clearly wastes chip area; and (2) determining the worst case scenario in all chips is a non-trivial task that consumes engineering resources. *Id.* at 1:37–40. The '012 patent further discloses that some emerging processing technologies prefer one spatial direction over another. *Id.* at 1:41–42. Existing layout generation systems, however, use identical minimal spacing and minimal width rules for both directions that lead to wasted chip area and underutilization of processing capabilities because the design rules must cover the worst case scenario in both directions. *Id.* at 1:42–46.

The '012 patent purportedly addresses these and other problems by providing a method and system for forming layout constraints to account for local and orientation processing dependencies. Ex. 1001, 1:51–54. By combining a local process modification value, which represents an additional safeguard beyond an original design rule constraint, with the original design rule constraint itself, it effectively creates a new constraint for every unique local situation. *Id.* at 1:55–64, 4:3–5. This mechanism adds extra safeguards to design rule formulation and improves chip yield by eliminating processing hotspots. *Id.* at 1:64–67, 4:5–6.

C. Illustrative Claim

Of the challenged claims, claim 1 is independent and it is directed to a method for generating design layout artwork implemented in a computer. Claims 2–11, 13, and 14 directly depend from independent claim 1. Independent claim 1 is illustrative of the challenged claims and is reproduced below:

1. A method for generating design layout artwork implemented in a computer, comprising:

receiving a design layout comprising a plurality of layout objects residing on a plurality of layers;
receiving descriptions of manufacturing process;
constructing a system of initial constraints among said layout objects;
computing local process modifications to change said initial constraints using said descriptions of manufacturing process;
constructing new local constraint distances by combining said local process modifications with constraint distances in said system of initial constraints;
enforcing said new local constraint distances; and
updating the coordinate variables of layout objects according to the solutions obtained from enforcing said new local constraint distances;
whereby a new layout is produced that has increased yield and performance.

Ex. 1001, 8:16–34 (emphasis added).

D. Instituted Grounds of Unpatentability

We instituted trial on the following grounds (Dec. on Inst. 31).

Reference(s)	Basis	Challenged Claim(s)
Allan (Ex. 1015)	§ 103(a)	1–5, 10, 11, 13, and 14
Allan (Ex. 1015) and Kroyan (Ex. 1006)	§ 103(a)	4 and 6–9

II. ANALYSIS

A. Claim Construction

In an *inter partes* review proceeding, claim terms of an unexpired patent are given their broadest reasonable interpretation in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b)

(2017).¹ Under the broadest reasonable interpretation standard, claim terms are generally given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art, in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

In its Petition, RPX proposes constructions for the following claim terms: (1) “width,” “space,” “overlap,” “enclosure,” and “extension” (claim 13); and (2) “description(s) of manufacturing process” (all challenged claims). Pet. 16–18. There is no dispute between the parties regarding the proper construction of these terms.

RPX does not propose a construction for the claim term “constraints,” but nonetheless advocates for a construction of this claim term that is the same as the construction applied by IYM in the Delaware Litigation. Pet. 33–35. According to RPX, in the Delaware Litigation, IYM argued for a broad construction of “constraints” to mean “limits on geometry parameters of the layout objects in the design layout.” *Id.* at 33 (citing Ex. 1017, 4). RPX argues that, because the claim construction standard at the Board is broader than the standard applied in district court, IYM should not be allowed to seek a narrower construction of this term in attempting to distinguish Allan. *Id.* at 33–34 (citing *Rembrandt Wireless Techs., LP v. Samsung Elecs. Co., Ltd.*, 853 F.3d 1370, 1377 (Fed. Cir. 2017) (“[T]he Board in IPR [*inter partes* review] proceedings operates under a broader

¹ A different rule applies for petitions filed on or after November 13, 2018. Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b)).

claim construction standard than the federal courts.”)). In its Response, IYM does not dispute RPX’s proposed construction for the term “constraints.” PO Resp. 14–17. After reviewing the record developed during trial, we agree with the parties that an appropriate construction of the term “constraints” is “limits on geometry parameters of the layout objects in the design layout.”

The parties, however, dispute the construction of the claim 1 phrase “enforcing said new local constraint distances.” PO Resp. 28–36; Pet. Reply 4–8; PO Sur-Reply 1–3. Although RPX does not propose a construction of this phrase in its Petition or Reply, it contends IYM’s proposed construction is incorrect. *See* Pet. 15–18; Pet. Reply 4–8.

IYM contends the phrase “enforcing said new local constraint distances” means “finding solutions (i.e., adjustments to the layout) that remove violations of the new local constraint distances,” and refers to the claims, Specification, Dr. Nagel’s and Dr. Bernstein’s cross-examination testimony, and their Declarations as supporting this construction. PO Resp. 17–20 (citing Ex. 1001, 8:26–27, 8:29–32, 4:17–21, 3:65–66, 4:17–54; Ex. 2012 ¶¶ 51–54). IYM also refers to the Delaware Litigation claim interpretation urged by IYM, a dictionary definition, and the “solution” in the next step of claim 1 as supporting this construction. *Id.* at 20–21 (citing Ex. 1017, 13–14; Ex. 2016, 17, 19; Ex. 2017, 472; Ex 2012 ¶ 56).

According to IYM, the Specification describes two embodiments, one of which applies a formula, the other applies heuristic techniques, and each includes removing violations. *Id.* at 17–19 (citing Ex. 1001, 4:25–27, 4:47–49, 8:29–32; Ex. 2012 ¶ 54). IYM then refers to a dictionary definition of “enforcing” as to “compel compliance with (a law, rule, or obligation),” and

contends “no reasonable interpretation of the claimed ‘enforcing said new local constraint distances’ limitations would permit violation of the new local constraint distances to remain without even attempting to fix them.” *Id.* at 20 (citing Ex. 2017, 472; Ex. 2012 ¶ 56).

IYM contends this proposed construction is the same construction asserted by IYM in the Delaware Litigation. *Id.* at 20–21 (citing Ex. 1017, 13–14). IYM contends Dr. Nagel’s cross-examination testimony contradicts RPX’s proposed construction and expressly agrees that the claimed enforcing step “is a step of removing violations of the new local constraint distances,” *id.* at 19–20 (citing Ex. 2013, 85:12–86:7; Ex. 2012 ¶ 55):

Q. ... Now, when you enforce the new local constraint distances, isn’t it fair to say that the result of that enforcing is a set of new coordinates for the layout objects?

A. Yes.

Q. Okay. And that set of new coordinates is such that there are no violations of the new local constraint distances *d_{new}*?

MR. JOHANNES: Objection. Form.

THE WITNESS: That’s correct.

BY MR. PACELLI:

Q. So the enforcing step in Claim 1 of the ’012 patent is a step of removing violations of the new local constraint distances; correct?

MR. JOHANNES: Objection. Form.

THE WITNESS: Yes. That’s correct.

BY MR. PACELLI:

Q. So after the enforcing step, there should be no violations of the new local constraint distances?

A. That’s correct.

Ex. 2013, 85:12–86:7.

IYM also refers to Dr. Bernstein’s Declaration, in which he stated “I agree with Dr. Nagel’s assessment that the claimed enforcing step ‘is a

step of removing violations of the new local constraint distances.’”

Ex 2012 ¶ 55.

RPX counters that IYM’s proposed construction is incorrect. Pet. Reply 4–9. According to RPX, the claim does not recite removing violations and, although the Specification describes two embodiments in which enforcing includes removing violations, these are simply preferred embodiments, and the Specification expressly states the invention is not limited to the disclosed embodiments. *Id.* at 5–8 (citing Ex. 1001, 2:1–4, 2:64–67, 4:17–21, 4:55–67). RPX argues that, even in the preferred embodiment that utilizes a formula, local constraint distances can be enforced even if the original layout does not violate them. *Id.* at 6–7 (citing Ex. 1001, 4:22–44, Fig. 2). According to RPX, “[g]iven that the resulting solution seeks to ensure compliance with **all** new local constraint distances when making modifications to the original layout, the optimization process seeks to ‘enforce’ both the ‘some of the local constraint distances’ that are ‘likely’ violated **and** those **other** local constraint distances that are **not** violated by the original layout.” *Id.* at 7 (citing Ex. 1001, 4:19–42).

RPX refers to the Delaware Litigation in which the U.S. District Court for the District of Delaware (“Court”) rejected IYM’s current claim construction and commented that it was “puzzling.” *Id.* at 4 (citing Ex. 2015, 4 n.4). The Court determined the construction of the phrase is “solving a set of equations after incorporating the new local constraint distances.” *Id.* Neither party proposes this construction in this proceeding. When asked about this construction at the oral hearing, RPX’s counsel stated the construction would be acceptable, except for inclusion of the term “equation” because the enforcement of inequalities may create uncertainty

with respect to “equation.” Tr. 38:2–23. According to RPX’s counsel, “[i]f you just substitute constraints for equations in the District Court construction, we’re fine with that construction.” *Id.* at 38:21–23.

RPX characterizes the cross-examination testimony of Dr. Nagel as not supporting IYM’s argument that the disputed limitation requires removing violations. Pet. Reply at 9. According to RPX, “Dr. Nagel acknowledged . . . there ‘**should** be no violations of the new local constraint distances’ that survive the enforcement step. But, importantly, Dr. Nagel was **not asked** if this was ‘required’ for enforcement of the local constraints, **nor** whether the [broadest reasonable interpretation] of the enforcing step was limited to removing violations.” *Id.*

During the oral hearing, RPX’s counsel directed us to the cross-examination testimony of Dr. Bernstein. Tr. 34:4–35:3, 107:4–21. The relevant portion of Dr. Bernstein’s cross-examination testimony is reproduced below.

Q. Okay. So just so I’m clear, in the context of the ’012 patent, every time step F is performed, violations are removed?

...

A. If there are violations, obviously, you have to qualify that, because there may not be a violation depending on the design. We don’t know. You could enforce without having a violation.

Ex. 1027, 185:6–13.

We begin our analysis by examining the intrinsic evidence, which supports a claim construction that removal of violations is not required. Upon reviewing the Specification of the ’012 patent, we do not find an explicit definition for the phrase “enforcing said new local constraint distances.” We, therefore, refer to its ordinary and customary meaning, as

would be understood by one of ordinary skill in the art, in the context of the entire disclosure. *Translogic*, 504 F.3d at 1257.

The Specification refers to local constraint enforcement together with removing violations on two occasions. First, when discussing the local constraint enforcement illustrated in Figure 2, the Specification discloses constructing an objective function at block 100, which, “[i]n a preferred embodiment,” is used “together with the linear constraint system [to] remove[] the new violations introduced by local constraint with minimal perturbation.” Ex. 1001, 4:22–27. When discussing “another preferred embodiment,” the Specification discloses that “the violations to local constraints are removed one at a time using heuristic procedures.” *Id.* at 4:47–49. Based on these disclosures, we agree with RPX the Specification describes removing violations in the context of preferred embodiments that are exemplary rather than required.

The plain language of independent claim 1 also supports treating the removal of violations as preferred embodiments that are exemplary rather than required. Independent claim 1 recites, in relevant part, “enforcing said new local constraint distances” and “updating the coordinate variables of layout objects according to the solutions obtained from enforcing said new local constraint distances.” Ex. 1001, 8:29–32. Notably absent from this claim language is an explicit requirement that enforcement includes removing violations. Instead, this claim language clearly indicates that “solutions” are “obtained from enforcing said new local constraint distances.” Obtaining solutions in this context is consistent with both the description of Figure 2 in the Specification and the Court’s construction of

“solving the set of linear equations after incorporating the new local constraint distances.” Ex. 1001, 4:18–54, Fig. 2; Ex. 2015, 4 n.4.

Turning to the extrinsic evidence, the testimony of Drs. Nagel and Bernstein is inconclusive. On the one hand, Dr. Nagel’s cross-examination testimony suggests removal of violations is required. Ex. 2013, 85:12–86:7. On the other hand, Dr. Bernstein’s cross-examination testimony suggests removal of violations is not required. Ex. 1027, 185:6–13. On their face, the referenced cross-examination testimony of Drs. Nagel and Bernstein is contrary to the position of their respective party. In addition, we note RPX’s counsel’s statement at the oral hearing that Dr. Nagel’s answer, when viewed in context, does not identify that the broadest reasonable interpretation of the “enforcing” limitation of claim 1 includes removing violations. Tr. 30:19–31:15. We also note RPX’s counsel’s statement at the oral hearing that Dr. Bernstein’s Declaration and cross-examination testimony do not identify that the broadest reasonable interpretation includes removing violations. Tr. 107:4–21 (citing Ex. 1027, 185:6–13, 186:15–22,).

The extrinsic evidence, in the form of the dictionary definition proffered by IYM, also is inconclusive. The CONCISE OXFORD ENGLISH DICTIONARY (11th ed. 2004) defines “enforce” as to “compel compliance with (a law, rule, or obligation).” Ex. 2017, 472. This definition, however, does not account for the scenario where there may not be a violation in the IC design. As Dr. Bernstein testified, “you can enforce without having a violation.” Ex. 1027, 185:12–13. As one example, a police officer enforcing a motor vehicle speed limit is not necessarily required to remove violators (e.g., by issuing speeding tickets), particularly when no motor vehicles are exceeding the speed limit. See Tr. 115:7–19.

In summary, upon weighing all the evidence bearing on the construction of “enforcing said new local constraint distances,” the extrinsic evidence is inconclusive and does not overcome the intrinsic evidence. We agree with RPX that the phrase “enforcing said new local constraint distances” does not require removing violations because the Specification only describes removing violations in the context of preferred embodiments. Instead, we construe this phrase to mean “solving a set of linear equations or constraints after incorporating the new local constraint distances,” which is consistent with the description of Figure 2 in the Specification of the ’012 patent, the plain language of independent claim 1, and the construction in the Delaware Litigation. Ex. 1001, 4:18–54, 8:29–32, Fig. 12; Ex. 2015, 4 n.4.

B. Obviousness Over the Teachings of Allan

RPX asserts that claims 1–5, 10, 11, 13, and 14 of the ’012 patent are unpatentable under § 103(a) over the teachings of Allan. Pet. 27–57. RPX explains how Allan teaches or suggests the subject matter of each challenged claim to one of ordinary skill in the art. *Id.* RPX also relies upon the Declaration of Dr. Nagel to support its positions. Ex. 1002 ¶¶ 101–133, 312–414. In its Response, IYM presents a number of arguments, most of which focus on whether Allan teaches or suggests “enforcing said new local constraint distances,” as recited in independent claim 1. PO Resp. 28–38. IYM relies on the Declaration of Dr. Bernstein to support its positions. Ex. 2012 ¶¶ 118–130.

We begin our analysis with the principles of law that generally apply to a ground based on obviousness, followed by an assessment of the level of

skill in the art, a brief overview of Allan, and the parties' contentions with respect to the challenged claims.

1. Principles of Law

A claim is unpatentable under § 103(a) if the differences between the claimed subject matter 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 said 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 skill in the art; and (4) when in evidence, objective indicia of non-obviousness (i.e., secondary considerations).² *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)); see *In re Warsaw Orthopedic, Inc.*, 832 F.3d 1327, 1333 (Fed. Cir. 2016) (citing *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006)).

² The parties do not address secondary considerations, which, accordingly, do not form part of our analysis.

To prevail on its challenges, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). “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”)). This burden never shifts to Patent Owner. See *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner does not satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

2. *Level of Skill in the Art*

There is evidence in the record before us that enables us to determine the knowledge level of a person of ordinary skill in the art. Relying on the testimony of its declarant, Dr. Nagel, RPX asserts that a person of ordinary skill in the art as of April 2004, which is the earliest priority date on the face of the ’012 patent, would be an individual who possesses “a bachelor’s degree in Electrical Engineering or the equivalent, along with at least two years of experience in developing and/or researching integrated circuit technology.” Pet. 15 (citing Ex. 1002 ¶¶ 30–32). IYM’s declarant, Dr. Bernstein, generally agrees with the assessment of RPX and Dr. Nagel, but further clarifies that “a person of ordinary skill in the art would have had a

sufficient familiarity with [electronic design automation] tools to be able to competently use such tools and understand their operation.” PO Resp. 12–13 (citing Ex. 1002 ¶ 31; Ex. 2012 ¶¶ 26–29).

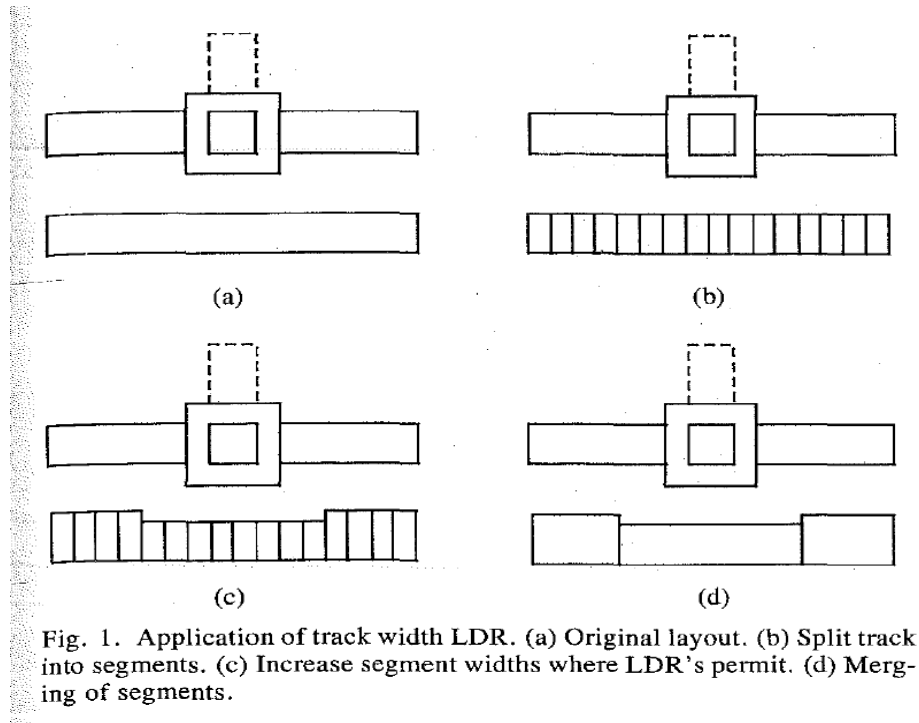
We do not discern a material difference between the assessments advanced by the declarants, nor does either party premise its arguments exclusively on its assessment of the level of skill in the art. Moreover, each party’s declarant appears to meet or exceed both parties’ assessments (see Ex. 1002 ¶¶ 2–13; Ex. 1003; Ex. 2012 ¶¶ 3–19, Curriculum Vitae), and either assessment of the level of skill in the art is consistent with the ’012 patent and the asserted prior art. We, therefore, adopt Dr. Nagel’s assessment and apply it to our obviousness evaluation below, but note that our conclusions would remain the same under Dr. Bernstein’s assessment.

3. *Allan Overview*

Allan “introduces the concept of local design rules” for IC layout optimization at the local level to increase yield. Ex. 1015, 1355. Allan explains that IC layouts are “bound by a set of design rules” that “determine the minimum size and spacing of all layers of the circuit geometry in an attempt to maximize the yield, performance, and reliability.” *Id.* Allan explains “the design rules are applied over the whole of the layout area” and are referred to as “global design rules (GDRs).” *Id.* Allan recognizes that these GDRs may give a “good layout . . . but are not necessarily optimized for the local layout conditions.” *Id.*

Allan’s solution to the non-optimal layout provided by “global” rules is a set of modifications to the global rules, specific to “local layout conditions,” which Allan refers to as “local design rules” (LDRs). *Id.* In

Figure 1, reproduced below, Allan illustrates an example of its process for increased track widths where permitted by local and global design rules.



Id. at 1357.

Figure 1(a), reproduced above, describes an “example layout” in which “the bottom metal track has a track width LDR applied to it.” *Id.* In Figure 1(b), “the track [width] is split into segments . . . and each segment is tested.” *Id.* “If there is space above or below the segment greater than that required for the GDR and the LDR separation, a new wider segment is generated.” *Id.* “All the design rules for the new larger segment are checked, and if there are no violations[,] the change in width is accepted,” as shown in Figure 1(c). *Id.* In Figure 1(d), the segments are merged. *Id.*

In Figure 2, reproduced below, Allan describes the algorithm used in Figures 1(a)–1(d).

Procedure WidthLDR Track

```
begin  
  Split Track into Segments (see fig. 1(b)).  
  for all Segments do {  
    if ( Space Above Segment  $\geq LDR + GDR$ ) AND  
      ( DesignRuleCheck = OK ) then Increase Segment Size (Top).  
    if ( Space Below Segment  $\geq LDR + GDR$ ) AND  
      ( DesignRuleCheck = OK ) then Increase Segment Size (Bottom).  
  }  
  Merge Segments (see fig. 1(d)).  
end
```

Fig. 2. Algorithm for track width LDR.

Id. at 1357.

Figure 2, reproduced above, describes the algorithm used in Figures 1(a)–1(d) wherein the track is split into segments, and for all the segments, if the space above and below the segment is determined to be greater than $LDR + GDR$, then the segment size can be increased if the design rule check is OK. Then, the segments are merged.

4. Claim 1

RPX contends Allan teaches all the steps recited in independent claim 1. Pet. 27–47 (citing Ex. 1015; Ex. 1002 ¶¶ 312–378). Following institution of trial, IYM argues Allan does not teach the limitation “enforcing said new local constraints” (“disputed limitation”) and does not address separately the remaining claim 1 limitations. See PO Resp. 28 n.8 (“While Patent Owner believes that Allan is directed to entirely different subject matter from the claimed invention of the ’012 Patent, and fails to disclose numerous claim limitations, for ease of explanation Patent Owner focuses solely on the

dispositive issue of Allan’s failure to disclose the ’012 Patent’s enforcement of new local constraint distances.”). For completeness, in our discussion below, where applicable, we incorporate our analysis of all the claim 1 limitations set forth in the Decision to Institute, and we address the RPX and IYM arguments regarding the disputed limitation.

Beginning with the preamble “[a] method for generating design layout artwork implemented in a computer,” RPX contends Allan describes a computer program (“LocDes”) that implements Allan’s techniques for analyzing and generating a new layout in which the program acts as a postprocessor of Caltech Intermediate Format (CIF) layout, and “uses the GDR layout to produce an enhanced circuit layout[.]” Pet. 28 (citing Ex. 1002, ¶¶ 313–314³; Ex. 1015, 1355:§ I, 1356:§ IV). RPX additionally contends Allan’s program takes the original layout in CIF format and processes it, using a set of LDRs. *Id.* RPX argues Allan’s Figure 9 also shows the program’s user interface, which allows the user to apply LDRs to individually selected pieces of circuit geometry. *Id.* (citing Ex. 1015, 1359:§ IV(C)(3), Fig. 9; Ex. 1002 ¶ 314).

RPX contends Allan teaches the step “receiving a design layout comprising a plurality of layout objects residing on a plurality of layers.” Pet. 29–31 (citing Ex. 1002 ¶¶ 315–320). RPX argues Allan’s CIF layout specification identifies each of the layout’s geometric objects, including their coordinates and on what IC layer each object resides. *Id.* at 29 (citing Ex. 1002 ¶ 316; Ex. 1011, 115–27). According to RPX, a person of ordinary

³ Although RPX cites Exhibit 1002 ¶¶ 313–144, based on the context, we understand Petitioner’s citation to be to Exhibit 1002 ¶¶ 313–314.

skill in the art (“POSA”) “would have understood receiving a layout in CIF format would encompass receipt of a layout including multiple objects on multiple layers.” *Id.* (citing Ex. 1002 ¶ 316); *see also* Ex. 1015, 1358–59:§ IV(B).

RPX contends that Allan teaches the step “receiving descriptions of manufacturing process.” Pet. 16–18, 31–33 (citing Ex. 1002 ¶¶ 321–28). According to RPX, this term should be assigned its plain and ordinary meaning, and a POSA would have understood the plain meaning of “descriptions of manufacturing process” to be consistent with its later use in claim 1—i.e., “computing local process modifications to change said initial constraints using said descriptions of manufacturing process.” *Id.* at 16–17. RPX argues a POSA would have understood that the term encompasses sufficient information to enable “computing local process modifications.” *Id.*

RPX contends Allan describes receiving design rules and simulation models. *Id.* at 31 (citing Ex. 1002 ¶ 323). RPX further contends a POSA would have understood Allan’s “design rules” and “simulation models” to be examples of information describing a “manufacturing process,” and this term (“manufacturing process”) would be construed to cover one or both of those, and/or other information. *Id.* at 31.

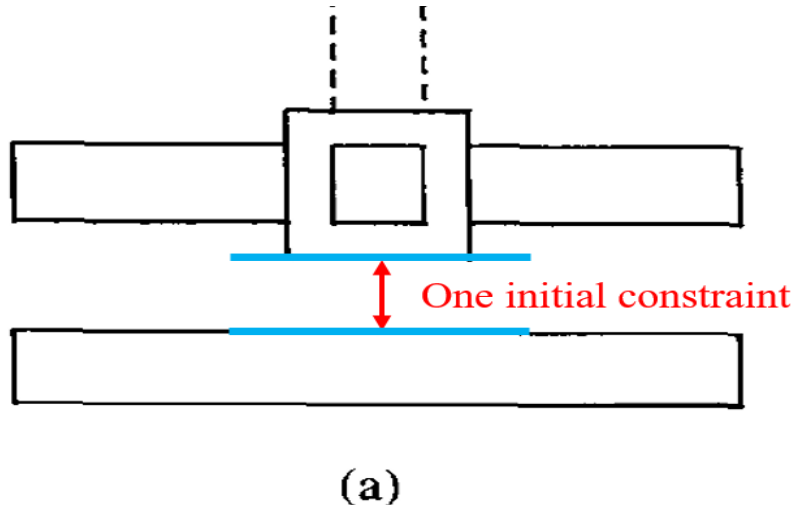
RPX contends defining Allan’s GDRs requires knowledge of the process and normally includes the generation of test structures or simulating such test structures. *Id.* at 31 (citing Ex. 1015, 1356:§§ II–II(A)). According to RPX, a POSA would have understood Allan’s design rules to be reflective of a manufacturing process. *Id.* at 32 (citing Ex. 1002 ¶ 324). RPX argues Allan notes that deriving LDRs requires even more knowledge

of the manufacturing process than GDRs “since the problem is no longer a ‘simple’ matter of finding one rule set to maximize yield of regular test structures.” *Id.* (citing Ex. 1015, 1357:§ II).

RPX argues Allan teaches the step “constructing a system of initial constraints among said layout objects.” Pet. 33–37 (citing Ex. 1002 ¶¶ 329–340). RPX argues the application of design rules (and circuit design considerations) during the design process can determine the “constraints” between adjacent layout objects. *Id.* at 34. RPX further argues “[c]onstructing the system of initial constraints,” under IYM’s construction in the Delaware Litigation, is determining the constraints among layout objects in the design. *Id.* (citing Ex. 1015, 3:16–43; Ex. 1017, 4; Ex. 1002 ¶ 331).

RPX contends Allan describes generating a system of constraints arising from application of the GDRs during the design process, which constrains positioning or other dimensions among layout objects. *Id.* at 35. RPX contends Allan describes a set of GDRs, and producing a layout that has been determined to be compliant with the GDRs. *Id.* (citing Ex. 1015, 1356: § IV(A)) (disclosing that “the original layout has been passed by a design rule checker”). RPX argues determining whether the original layout is compliant with the design rules involves applying the rules to the layout and creating constraints for each layout object. *Id.* According to RPX, for example, Allan’s Figure 1 illustrates the result of applying a minimum interobject distance rule between adjacent layout objects, generating a compliant layout. *Id.* Figure 1(a) below, annotated in red and blue by RPX, includes at least two layout objects, which for ease of description can be

termed the “top” object and the “bottom” object. *Id.* at 35–36 (citing Ex. 1002 ¶¶ 333–334).



In annotated Figure 1(a) above, RPX contends the initial constraint of this example is derived from a GDR regulating an interobject distance, wherein the rule may generally specify that two objects may not be closer than some specified minimum distance. *Id.* at 36. RPX additionally contends the rule becomes a constraint on the two objects shown in Figure 1(a)—i.e., the bottom object must be separated from the top object by at least the minimum distance. *Id.* RPX contends the constraint imposed on the bottom object may be expressed as “Space Above Object $\geq$ GDR,” where “GDR” is the value of the minimum interobject distance specified by the GDR. Annotated Figure 1(a) above shows the initial constraint in red and the edges of the two objects driving the positioning of the two objects according to the constraint in blue. *Id.* (citing Ex. 1002 ¶ 334).

RPX argues because Allan’s LocDes program is “a design rule checker” that accepts “only those changes that do not violate any of the global or other local design rules,” Allan constructs a “system of initial

constraints” (under IYM’s construction) that captures the constraints between layout objects in the received design layout. *Id.* at 36–37 (citing Ex. 1015, 1356:§ IV, Ex. 100 ¶¶ 335–336). RPX further argues determining this set of initial constraints between layout objects is “constructing a system of initial constraints among said layout objects.” *Id.* at 37 (citing Ex. 1002 ¶ 337).

RPX argues Allan teaches the step “computing local process modifications to change said initial constraints using said descriptions of manufacturing process.” Pet. 38–40 (Ex. 1002 ¶¶ 341–349). According to RPX, the ’012 patent describes that “local process modification to the design rule constraint distance transforms the global design rule constraints into location specific constraints.” *Id.* at 38 (citing Ex. 1001, 3:44–46). RPX contends the ’012 patent describes that the “computing” includes *either* performing simulations to derive the modifications *or* retrieving a predetermined value from a look-up table. *Id.* (citing Ex. 1001, 5:1–6:2; *see also* Ex. 1001, claims 8 and 9; Ex. 1002 ¶¶ 342–343).

RPX argues the values specified by Allan’s LDRs are the “local process modifications.” *Id.* at 38. According to RPX, Allan describes techniques to compute the values for the LDRs, which may be stored for use by its program, and Allan also explains that the values of the LDRs are “changes” to the initial constraints. *Id.* (citing Ex. 1015, 1355–56:§ II; Ex. 1002 ¶ 343).

RPX contends Allan describes evaluating a layout using LDRs “to determine where changes in layout generated from GDR set[s] should be performed.” *Id.* (citing Ex. 1015, 1355:§ II). RPX further argues Allan’s LDRs are the “local process modifications,” as recited in claim 1. *Id.* RPX

argues the LDRs define variations in object dimensions with respect to the original GDRs, based on local conditions within an IC layout. *Id.*

According to RPX, Allan specifically observes that “[t]here are a number of potential layout changes that can be made as follows: track displacement, increased contact size . . . , increased contact overlap, increased track width.” *Id.* at 38–39 (citing Ex. 1015, 1355:§ I). According to RPX, Allan’s LDRs, which are the local process modifications, change the initial constraints (specifying values derived from the global rules) on a layout. *Id.* at 39 (citing Ex. 1002 ¶ 344).

RPX contends Allan’s design rules, including its local design rules, are generated using information on a manufacturing process that is to be used, and are reflective of that manufacturing process. *Id.* (citing Ex. 1015, 1355:§ II.). RPX contends LDRs are applied to GDR-generated layouts to achieve this further local optimization. *Id.* RPX additionally contends Allan also discloses that, “[w]hile it is intended that the yield of the resulting layout will be greater than the initial GDR layout, **this can be guaranteed only if the fabrication process is understood well enough** to ensure that the LDRs are an accurate reflection of the relative yield of the layout options under test.” *Id.* (citing Ex. 1015, 1355:§ I).

RPX contends the Allan LDRs are computed using the received simulation models. *Id.* at 40. RPX contends the GDRs and the simulation models are a “description of manufacturing processes.” *Id.* RPX contends Allan explains that multiple LDRs can be derived from the simulation results. *Id.* (citing Ex. 1015, 1356:§ II(A)). According to RPX, a POSA would have appreciated that, when a tool “applies” an LDR in this manner, the LDR would be predefined, based on the simulations as discussed above,

and that the “value” for the LDR would be retrieved from storage. *Id.* (citing Ex. 1002 ¶ 347). RPX contends retrieving the value for an LDR from a data storage falls within the scope of “computing” a local process modification in this limitation. *Id.* (citing Ex. 1002 ¶ 348).

RPX argues Allan teaches the step “constructing new local constraint distances by combining said local process modifications with constraint distances in said system of initial constraints.” Pet. 40–43 (citing Ex. 1002 ¶¶ 350–361). According to RPX, Allan discloses constructing new local constraint distances by creating new constraints for existing and/or new layout objects, and by combining values specified by LDRs (the local process modifications) with the constraint distances in the initial constraints. *Id.* at 40 (citing Ex. 1002 ¶ 351).

RPX argues Allan describes an example of “constructing new local constraint distances.” *Id.* at 41. Allan’s Figure 1(a), below, annotated by RPX, shows the initial constraint.

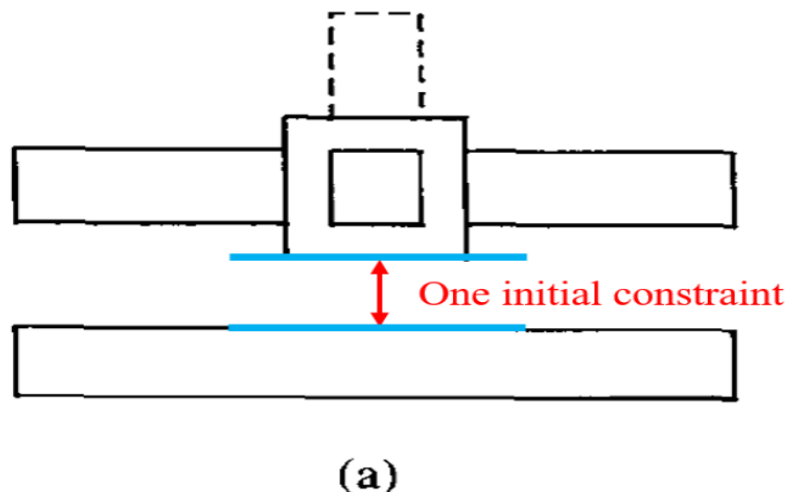


Figure 1(a) annotated by RPX to show one initial constraint

RPX argues Allan's Figure 1(b), below, annotated by RPX, illustrates that an original object, to which the single initial constraint was applied, is divided into a set of local objects, such that a local constraint may be identified as a modification of the single initial constraint. *Id.*

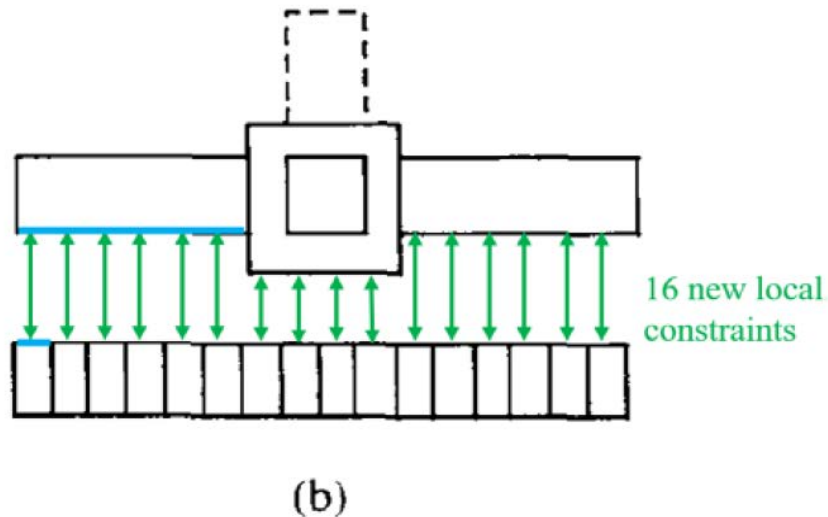


Figure 1(b) annotated by RPX to show 16 new local constraints.

RPX argues the new local constraint distances include a constraint distance for each of the new bottom objects (with the existing, top object), where before there was a single constraint, and the new local constraint distances also result from modifying the initial constraint to have a different constraint distance. *Id.* at 41–42. RPX also argues Allan describes that a local value for an LDR is added to an initial value from the initial constraint (the GDR) to yield the value for the new local constraint. *Id.* at 42. According to RPX, the new local constraints may even be evaluated using different edges in the layout, as illustrated by comparing the blue lines in annotated Figure 1(b) above. *Id.* (citing Ex. 1002 ¶¶ 352–355).

RPX argues Allan's process leverages the new constraint distances to determine whether and how it can make adjustments to the layout, wherein the new local constraints are evaluated for each local layout object and constrain the ability of Allan's process to make adjustments to the layout in the area of that local layout object. *Id.* (citing Ex. 1015, 1356:§§ I, IV (disclosing that the process "attempts small changes in layout based on the LDR's," accepts "only those changes that do not violate any of the global or other local design rules," and "no changes are made to the layout except where there is good evidence to suggest that a higher yield can be obtained") Ex. 1002 ¶ 356)).

RPX argues, in Figure 2, annotated by RPX below, Allan illustrates the new local constraint for each local object, and the process of constructing a new local constraint distance by combining a local process modification with a constraint distance for an initial constraint (*id.*):

**if (Space Above Segment $\geq$ LDR + GDR) AND
 (DesignRuleCheck = OK) then Increase Segment Size (Top).**

RPX argues, in annotated Figure 2 above, the constraint for each of the multiple "bottom" objects are "Space Above Segment $\geq$ LDR + GDR," and the new local constraint is created by combining a local process modification value (specified by an LDR) with the constraint distance specified by the initial constraint (specified by a GDR). *Id.* at 43. RPX argues this new local constraint differs from the initial constraint discussed above regarding Figure 1(a): "Space Above Object $\geq$ GDR". *Id.* (citing Ex. 1002 ¶¶ 357–358).

RPX argues each combination of LDR + GDR (i.e., each new local constraint distance) constrains a modification that could be made by Allan's LocDes program. *Id.* According to RPX, in Allan's Figure 2, the combination LDR + GDR constrains whether and how much the track width can be increased by a distance between objects, and therefore creates a "new local constraint distance." *Id.* (citing Ex. 1015, 1357:§ IV(A)(1) ("If there is space above or below the segment greater than that required for the GDR and the LDR separation, a new wider segment is generated. All the design rules for the new larger segment are checked, and if there are no violations, the change in width is accepted (Fig. 1(c))."); Ex. 1002 ¶ 359).

In view of the above, we determine that RPX has met its burden to show, by a preponderance of the evidence, that Allan teaches or suggests the above limitations of claim 1.

The disputed limitation: "enforcing said new local constraint distances"

As discussed in our claim construction section, *supra*, RPX and IYM dispute the construction of the phrase "enforcing said new local constraint distances" wherein RPX contends this phrase does not require removing violations and IYM contends this phrase requires removing violations. We agree with RPX's construction that this phrase does not require removing violations because the Specification only describes removing violations in the context of preferred embodiments. Instead, we construe this phrase to mean "solving a set of equations or constraints after incorporating the new local constraints," which is consistent with the description of Figure 2 in the Specification of the '012 patent, the plain language of independent claim 1,

and the construction in the Delaware Litigation. Ex. 1001, 4:18–54, 8:29–32, Fig. 12; Ex. 2015, 4 n.4.

RPX argues Allan teaches the disputed limitation as properly interpreted. Pet. 43–44; Pet. Reply 3–10. Alternatively, RPX argues that, even applying IYM’s alleged incorrect and narrow interpretation requiring removing violations, Allan still teaches the disputed limitation. Pet. Reply 10–19. We begin our analysis by addressing RPX’s position that Allan teaches the disputed limitation as properly interpreted and then we turn to RPX’s alternative position.

RPX argues Allan teaches the step “enforcing said new local constraint distances.” Pet. 43–44 (citing Ex. 1002 ¶¶ 362–365). RPX argues Allan evaluates opportunities for modifying the layout geometry in accordance with the local design rules, so long as such modifications do not violate any of the constraints. *Id.* (citing Ex. 1015, 1356:§ IV (LocDes program “accept[s] only those changes that do not violate **any** of the global or other local design rules.”)).

RPX argues Allan discloses that the algorithm in Figure 2 is “used by the program to **adjust layout**.” *Id.* at 44 (citing Ex. 1015, 1356:§ IV(A), Fig. 2 (showing that the conditional “if (Space Above/Below Segment $\geq$ LDR + GDR)” enforces the new constraint by permitting movement up until this condition fails)). RPX argues the “DesignRuleCheck” in combination with “Space Above/Below Segment $\geq$ LDR + GDR” enforces the constraints. *Id.* (citing Ex. 1002 ¶ 364).

In its Response, IYM contends Allan does not teach removing violations and, therefore, does not teach or suggest the disputed limitation. PO Resp. 28–33. According to IYM:

In summary, in Allan, either (i) a track segment's width is increased because there are no violations of the purported "new local constraint distances" (i.e., "LDR+GDR"), or (ii) a track segment's width is not increased precisely because the layout violates (and continues to remain in violation of) the purported new local constraint distances. In either situation, Allan plainly does not teach the claimed step of "enforcing said new local constraint distances," and in fact it teaches quite the opposite: if there is a violation, leave it; if there is none, keep increasing the track segment until a violation is created. Ex. 2012, Bernstein Dec. at ¶ 123.

Id. at 33.

In its Reply, RPX argues Allan discloses the disputed limitation because the claim does not require removing violations, and notes "IYM had every opportunity to draft the claims more narrowly to be limited to removing violations of new local constraint distances but did not." Pet. Reply 4–9.

In its Sur-Reply, IYM argues its proposed claim construction (requires removing violations) applies and argues, "[i]f, however, the claimed method is able to successfully remove at least some existing violations, then 'enforcement' has occurred." PO Sur-Reply 1–2 (citing Ex. 1027, 218:5–221:12; 341:5–342:10).

Based on the record developed during trial, we agree with RPX because, under the correct construction (removing violations is not required), Allan teaches the disputed limitation. In particular, as discussed, *supra*, Space Above/Below Segment $\geq$ LDR+GDR are constraints that are enforced in Allan because the modifications to the layout resulting from LDR+GDR solve problems arising from an initial set of GDRs without violating any other GDRs or LDRs. Ex. 1015, 1356. Stated differently,

after incorporating the new local constraints (i.e., LDRs) into the GDR constraints, Allan solves the initial problems arising from these GDRs by permitting movement without violating any other GDRs or LDRs. We credit Dr. Nagle's testimony, referring to Figure 2 of Allan, that the conditional "if (Space Above/Below Segment $\geq$ LDR + GDR) enforces the new constraint by permitting movement up until this condition fails" because this testimony is consistent with the teachings in Allan discussed above. Ex. 1002 ¶ 364.

Additionally, assuming *arguendo* that the disputed limitation requires removing violations, RPX argues Allan also teaches the disputed limitation. Pet. Reply 11. According to RPX, Allan's "Increase Track Width" enforces new local constraint distances and is done by "imposing new local **maximum** constraint distances on the **available space** above and below each new segment." *Id.* (citing Pet. 22–27; Ex. 1015, Figs. 1, 2, 1355–57). According to RPX, the LocDes program decreases the space above/below until the space above/below is no longer greater than or equal to the new maximum local constraint distance ("LDR + GDR"), at which point no further increases in the segment size will be made. *Id.* at 13. RPX then argues "the routine thus seeks to remove violations of the new local maximum constraint on the space above/below the segment by increasing the segment until the maximum constraint on the free space above/below the segment is no longer violated—i.e., the space above/below is less than LDR+GDR." *Id.* at 13–14 (citing Allan at 1355–57).

In its Sur-Reply, IYM argues RPX's argument in its Reply that Allan's LDR+GDR is a maximum constraint on the space between tracks should not be entitled to consideration because it is a new argument that should have been raised earlier. Sur-Reply 3 (citing *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369–70 (Fed. Cir. 2016)). According to IYM, RPX's position is inconsistent with the position taken in the Petition that the space above segments must be greater than, or equal to, "LDR+GDR"—an alleged minimum spacing requirement." *Id.* at 3–4. IYM further argues RPX's assertion of a maximum constraint is not supported by the record and notes there is no Reply declaration from Dr. Nagel supporting this position and, therefore, no citation to Dr. Nagel's testimony. *Id.* at 5–6. According to IYM, Allan limits track increase to 1.5x the minimum track width, 1.5x the minimum spacing, no global design rules are violated, and includes no requirement to keep increasing track width until the space falls below LDR+GDR. *Id.* at 6–8 (citing Ex. 1015 at 1360, Ex. 1027, 238:18–240:13, 146:6–147:12).

We agree that RPX's argument that Allan's LDR+GDR is a *maximum* constraint on the space between tracks is a new argument presented for the first time in the Reply Brief. Although a constraint may be a minimum or a maximum constraint, based on the record developed during trial, RPX's belated presentation of this argument unfairly prejudices IYM and, therefore, should not be entitled to consideration.

Remaining undisputed claim 1 limitations

RPX argues Allan teaches the step "updating the coordinate variables of layout objects according to the solutions obtained from enforcing said new local constraint distances." Pet. 44–45 (citing Ex. 1002 ¶¶ 366–371).

RPX contends Allan describes that its program “produce[s] an enhanced circuit layout” and “adjust[s] layout” by using LDRs “to determine where changes in layout ... should be performed.” *Id.* at 44 (citing Ex. 1015, 1355:§§ I–II, 1356:§ IV(A)). RPX argues, as shown in Figure 2 of Allan and discussed *supra*, if the “if” statement is satisfied, then track width is increased. *Id.* at 45. According to RPX, if these conditions are satisfied, the layout geometry is modified, and then stored in a data structure. *Id.* (citing Ex. 1015, 1358–59:§ IV(B), Fig. 2); *see also* Ex. 1015, Fig. 1, 1357:§ IV(A)(1); Ex. 1002 ¶¶ 368–370.

Finally, RPX argues to the extent that the “whereby” clause in claim 1 is limiting, Allan discloses “whereby a new layout is produced that has increased yield and performance.” Pet. 45–47 (citing Ex. 1002 ¶¶ 372–376). RPX argues that in the Delaware Litigation, IYM contends that the phrase “whereby a new layout is produced that has increased yield and performance” is part of a “whereby” clause “that is not limiting and therefore does not need to be construed.” *Id.* at 46 (citing Ex. 1017, 15). RPX argues IYM should not be permitted to take a contrary, narrower position here. *Id.* (citing *Rembrandt*, 853 F.3d at 1377 (“[T]he Board in IPR proceedings operates under a broader claim construction standard than the federal courts.”)).

RPX argues Allan is titled “An Yield Improvement Technique for IC Layout Using Local Design Rules,” which describes that design rules are used to constrain IC layouts “***in an attempt to maximize the yield, performance, and reliability.***” *Id.* (citing Ex. 1015, 1355:§ I). RPX contends Allan discloses that “***[t]he yield can be increased*** by more effective use of silicon area through the application of local design rules to

layouts that have been generated from the normal ‘global’ design rules.” *Id.* (citing Ex. 1015, 1362:§ VI (“Local design rules can be used to **increase the yield** in processes that suffer from conductor shorts, contact problems, and conductor breaks[.]”)). According to RPX, a POSA would have understood that Allan’s techniques are intended to generate a new layout resulting in fabricated integrated circuits with increased yield and performance. *Id.* (citing Ex. 1002 ¶¶ 374–375).

In view of the above, we determine that RPX has met its burden to show, by a preponderance of the evidence, that Allan teaches or suggests the remaining undisputed limitations of claim 1.

Other claim 1 issues

IYM argues (1) Allan addresses a fundamentally different problem than the one addressed by the ‘012 patent because Allan doesn’t disclose the same solution provided by the ‘012 patent; and (2) RPX blurs the line between anticipation and obviousness. Prelim. Resp. 23–42.

Regarding the fundamentally different problem, IYM contends the ‘012 Patent is directed to solving a hotspot problem not addressed by Allan, whereas Allan is directed to a very different problem of the best use of any redundant space on an initial layout. *Id.* at 23–24.

Based on the record developed during trial, we are not persuaded by IYM’s argument in this regard because claim 1 does not recite hotspots, much less solving a hotspot problem. Ex. 1001, 8:16–34. We note dependent claim 6 recites hotspots (*id.* at 8:48–53); however, RPX’s challenge to claim 6 is not based on Allan alone, but instead is based on Allan in combination with Kroyan. Pet. 67–68. In addition, we note that it is well-settled that simply because a reference has a different objective does

not preclude a person of ordinary skill in the art from using its teachings in an obviousness evaluation. *See In re Heck*, 699 F.2d 1331, 1333 (Fed. Cir. 1983) (“The use of patents as references is not limited to what the patentees describe as their own inventions or to the problems with which they are concerned. . . .”); *see also EWP Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907 (Fed. Cir. 1985) (“A reference must be considered for everything that it teaches, not simply the described invention or a preferred embodiment.”).

We also are not persuaded by IYM’s argument that RPX blurs the line between anticipation and obviousness. Prelim. Resp. 25–26. Regarding obviousness based on Allan alone, RPX explains:

The claims call out specific features that do not contribute to the purported inventiveness of the ’012 patent and are instead the type of information that publications in this field typically assume is within the reader’s knowledge and do not explicitly discuss. For this reason, . . . obviousness grounds are presented rather than anticipation, even where a single reference is cited. Dr. Nagel’s testimony is cited for these well-known features, together with supporting evidence.

Pet. 8.

Under the circumstances described by RPX, it is appropriate to apply a single prior art reference—in this case, Allan—together with the background knowledge of one of ordinary skill in the art—as evidenced by Dr. Nagel’s supporting testimony—in analyzing obviousness. *See Monsanto Tech. LLC v. E.I. DuPont de Nemours & Co.*, 878 F.3d 1336, 1346–47 (Fed. Cir. 2018) (“Though less common, in appropriate circumstances, a patent can be obvious in light of a single prior art reference if it would have been obvious to modify the reference to arrive at the [claimed] invention.”)

(quoting *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016)); *see also Realtime Data LLC v. Iancu*, 912 F.3d 1368, 1373 (Fed. Cir. 2019) (affirming the Board’s conclusion that claims were obvious based on one prior art reference alone, notwithstanding patent owner’s argument that the ground at issue would have been more properly raised under 35 U.S.C. § 102).

Summary

In view of the above, we find RPX has shown, by a preponderance of the evidence, that the subject matter of claim 1 is unpatentable over Allan.

5. Dependent claims 2–5, 13, and 14

RPX contends Allan teaches the limitations of dependent claims 2–5, 13, and 14. Pet. 47–57 (citing Ex. 1015; Ex. 1002 ¶¶ 379–398, 406–414). IYM does not address separately RPX’s explanations and supporting evidence as to how the teachings of Allan account for the limitations of dependent claims 2–5, 13, and 14. *See generally* PO Resp. 24–47. We have reviewed RPX’s explanations and supporting evidence regarding these dependent claims, and we agree with and adopt RPX’s analysis showing that the teachings of Allan account for all the limitations recited in dependent claims 2–5, 13, and 14. *See* Pet. 47–57. RPX, therefore, has shown, by a preponderance of the evidence, that dependent claims 2–5, 13, and 14 are unpatentable over Allan.

6. Claim 10

Regarding claim 10, RPX argues Allan discloses “the step of enforcing new local constraint distances comprises optimizing a predefined objective function for optimizing measurable performance of a layout, subject to said new local constraint distances.” Pet. 53 (citing Ex. 1002

¶¶ 398–401). According to RPX, in its enforcement of new local constraint distances, Allan discloses “optimizing a predefined objective function.” *Id.* RPX contends, in the pseudocode (Figure 2), Allan discloses predefined objective functions—namely, that distances meet certain LDR + GDR statements—without violating “any of the global or other local design rules.” *Id.* (citing Ex. 1015, 1356:§ IV; Ex. 1021 ¶¶ 399–400).

RPX contends Allan explains that the initial GDRs “are not necessarily optimized for the local layout conditions.” *Id.* (citing Ex. 1015, 1355:§I). According to RPX, Allan’s LDRs “define the **best values** of track width and contact size/overlap in relation to the local layout conditions” and RPX contends Allan notes “that the yield of circuits fabricated-using layout generated from a GDR set can be increased by searching for instances of local nonoptimal layout, applying an LDR set, and adjusting the layout to meet the new design rules.” *Id.* According to RPX, this optimization is done in accordance with LDRs, which are design rules that “attempt to maximize . . . performance.” *Id.* at 54 (citing Ex. 1015, 1355:§I (“[Design] rules determine the minimum size and spacing of all layers of the circuit geometry in an attempt to maximize the yield, performance, and reliability.”); Ex. 1002 ¶ 401).

IYM contends Allan does not disclose the limitation of dependent claim 10. PO Resp. 38–42. According to IYM, referring to a dictionary definition, an objective function is “the function of which one seeks the optimum [e.g., maximum or minimum] in an optimization problem, especially one with constraints.” *Id.* at 39 (citing Ex. 2021 at 396, 401 (Collins Dictionary of Mathematics (2d ed. 2002))). IYM argues, “Consistent with that definition, the ’012 patent describes an embodiment

for enforcing the new local constraint distances through the use of ‘an objective function $C_t \cdot X$, where C_t is a row vector of coefficients for achieving various optimization objectives.’” *Id.* (citing Ex 1001 at 4:22–24). According to IYM, in this embodiment, the enforcing step solves the linear system of minimizing $C_t \cdot X$, subject to the new local constraint distances. *Id.* (citing Ex. 1001, 4:35–36; Ex. 2012 ¶ 133).

Applying this definition, IYM argues Allan simply discloses three algorithms for attempting to take advantage of unused layout space and RPX appears to rely on the “if” statements discussed, *supra*, that allow a layout object to be moved on the conditions that there is sufficient space and no design rules will be violated. *Id.* at 40 (citing Pet. 53). According to IYM, the “if” statement “cannot be an “objective function” because Allan does not attempt to minimize or maximize it. *Id.* IYM argues Dr. Nagel’s statement that Allan’s “Increase Segment Size (Top)” is an instruction to increase segment size, not an objective function to be optimized. *Id.* at 40 (citing Ex. 1002 ¶ 400; Ex. 2012 ¶ 134). IYM further argues RPX’s characterization of Allan is incorrect and based on partial and out of context quotations. *Id.* For example, according to IYM, Allan’s reference to “best values” is merely laudatory and RPX’s contention that Allan’s optimization is done in accordance with LDRs that attempt to maximize performance is incorrect because Allan is referring to global design rules, not local design rules. *Id.* at 41–42 (citing Pet. 53–54; Ex. 1015, 1355, 1356; Ex. 2012 ¶ 135).

In its Reply Brief, RPX, once again, refers to Allan’s LocDes Program and Dr. Nagel’s explanation that Allan discloses predetermined objective functions—namely, that distances meet certain LDR+GDR statements—without violating any of the global or other local design rules. Pet. Reply 19

(citing Pet. 53–54; Ex. 1002 ¶¶ 398–401). According to RPX, Allan’s LocDes Program seeks to locally optimize the width of every track segment by minimizing the free space above/below the segment by optimizing the objective function and thereby maximize the width of the track segment to increase yield. *Id.* at 20 (citing Ex. 1015, § II A. 2–3). RPX notes Allan’s statement, “[w]hile this will not necessarily give the optimal layout, it will produce a good approximation to it in a reasonable time.” *Id.* at 21 (citing Ex. 1015, 1356: § IV). RPX then argues “an objective function is one that seek the optimum” and that is what Allan does by optimizing the layout pursuant to the imposed constraints. *Id.*

In its Sur-Reply, IYM submits that RPX presents an impermissible first time argument—that Allan seeks to maximize the track width by minimizing available spaces above/below it—because the Petition only alleged that “Allan discloses predetermined objective functions, namely that distances meet certain LDR+GDR statements.” PO Sur-Reply 9 (citing Pet. 53; Pet. Reply 20). IYM also further argues Allan does not seek to minimize the space between tracks, because any decrease in spacing is subject to conditions on track width increase. *Id.*

Based on the record developed during trial, we are not persuaded by RPX’s arguments, particularly because, although Allan teaches, subject to the constraints, minimizing the free space above/below the segment by optimizing the objective function and *increasing* the width of the track segment to increase yield, RPX specifically argues Allan teaches *maximizing* the width of the track segment. We agree with IYM that this is an impermissible new argument. Petitioner’s arguments prior to the Reply Brief address only the minimum constraints $\geq \text{LDR} + \text{GDR}$ and they do not

characterize the constraint as seeking to maximize the track width by minimizing available spaces above/below it. *Compare* Pet. 53–54, with Pet. Reply 20. This argument appears for the first time in the Reply Brief and appears to be directed to IYM’s uncontested proffered definition, *supra*, that an “objective function is the function of which one seeks the optimum (e.g., maximum or minimum) in an optimization problem, especially one with constraints.” Additionally, RPX’s arguments regarding claim 10 are not persuasive because RPX has not demonstrated sufficiently that the width is maximized.

In view of the above, we find RPX has not shown, by a preponderance of the evidence, that the subject matter of claim 10 is unpatentable over Allan.

7. Claim 11

RPX contends claim 11 is written in Markush format, as it recites the phrase “selected from a group consisting of.” Pet. 54 (citing *Abbott Labs. v. Baxter Pharm. Prod., Inc.*, 334 F.3d 1274, 1280 (Fed. Cir. 2003)). As such, RPX contends Allan need only disclose one of the three listed objective functions to disclose this limitation and Allan discloses at least two of the limitations of claim 11. *Id.* (citing Nagel ¶¶ 402–405).

Regarding the first limitation, “objective function for legalizing the layout with minimal changes from the original layout,” RPX argues Allan states that “no changes are made to the layout except where there is good evidence to suggest that a higher yield can be obtained.” *Id.* (citing Allan, 1355:§ I). RPX argues Allan further cautions “that any changes that result from the application of LDRs to a layout do not cause a degradation in performance of the circuit.” *Id.* (citing Allan, 1356:§ III). According to

RPX, Allan's procedure thus "legaliz[es] the layout" (with respect to the LDRs) "with minimal changes from the original layout" (by virtue of not making unnecessary or harmful changes). *Id.* at 54–55 (citing Nagel ¶ 404).

In its Response, IYM argues Allan's changes are not "minimal" as Allan makes many changes, including unnecessary changes. PO Resp. 42–44 (citing Pet. 54–55; Allan Figs. 12 (a), (b)); Ex. 1015, 1361; Ex. 2013; Tr. 127:9–16, 124:7–24; 126:12–14; Ex. 2012 ¶ 138). IYM argues Allan teaches its methods are used only "once the area has been defined," and does not attempt to optimize the layout at all." *Id.* at 46 (citing Ex. 1015 at 1355; Ex. 2013, 157:2–17, 123:18–25, 152:24–153:2; Ex. 2012 ¶¶ 140, 141).

In its Reply Brief, RPX counters that Allan's objective function (Space Above/Below Segment $\geq$ LDR+GDR), discussed *supra*, establishes that no change is made based on LDRs unless good evidence exists that it would increase yield and not degrade performance. Pet. Reply 21 (citing Pet. 54–55). According to RPX, like the '012 patent, Allan makes changes only because they are believed to increase yield. *Id.* at 22 (citing PO Resp. 42; Ex. 1002 ¶ 42; Ex. 2012 ¶ 37; Ex. 1001, Abstract, 3:1–3; Tr. 5:22–6:5, 65:18–20).

IYM asserts in its Sur-Reply that RPX reiterates in its Reply that Allan does not change a layout "unless 'good evidence' exists that it would increase yield and not degrade performance," while ignoring Patent Owner's evidence that Allan's techniques do not "legaliz[e] the layout with minimal changes." PO Sur-Reply 9 (citing Reply Br. at 21). According to IYM, RPX's unsupported argument that Allan's undefined "good evidence" results in minimal layout changes is contradicted by Allan's teachings and Dr. Nagel's testimony. *Id.* (citing Resp. at 42–43).

Based on the record developed during trial, we are persuaded by RPX's arguments, particularly Allan's teaching that "no changes are made to the layout except where there is good evidence to suggest that a higher yield can be obtained." Ex. 1015, 1355, § I. Allan expressly teaches no changes are made, except where there is good evidence to suggest higher yield, and IYM's assertions to the contrary, regarding purported unnecessary changes, do not outweigh the express general teaching of Allan. Thus, we are persuaded that Allan teaches the claim 11 limitation "objective function for legalizing the layout with minimal changes from the original layout."

Therefore, we find RPX has shown, by a preponderance of the evidence, that Allan teaches this limitation. Because claim 11 is written in Markush format, RPX has shown Allan teaches the subject matter of this claim by teaching one of the three limitations recited therein. *See supra*.

C. Obviousness Over the Combined Teachings of Allan and Kroyan

RPX contends that claims 4 and 6–9 of the '012 patent are unpatentable under § 103(a) over the combined teachings of Allan and Kroyan. Pet. 64–71. RPX explains how this proffered combination teaches or suggests the subject matter of each challenged claim, and provides reasoning as to why one of ordinary skill in the art would have been prompted to modify the references' teachings. *Id.* RPX also relies upon the Declaration of Dr. Nagel to support its positions. Ex. 1002 ¶¶ 416–61. IYM's arguments solely focus on dependent claim 9. PO Resp. 47–52. IYM relies on the Declaration of Dr. Bernstein to support its positions. Ex. 2012 ¶¶ 142–147.

We begin our analysis with a brief overview of Kroyan, and then we address the parties' arguments and evidence with respect to dependent claim 9.

1. Kroyan Overview

Kroyan generally relates to a system and method for designing ICs fabricated by a semiconductor manufacturing process and, in particular, to designing ICs to enhance manufacturability and improve yield. Ex. 1006, 1:22–28. Figure 3 of Kroyan, reproduced below, illustrates a method for IC design in accordance with one embodiment. *Id.* at 4:43–45.

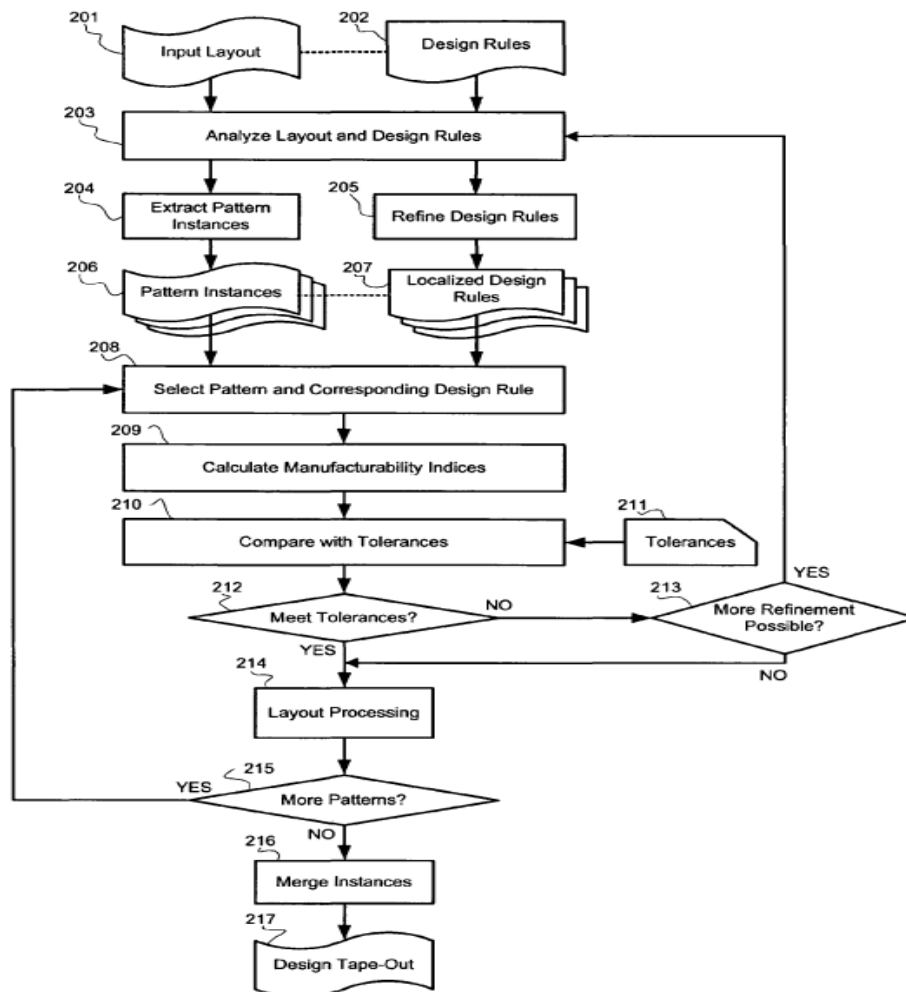


Figure 3

Figure 3 of Kroyan, reproduced above, illustrates that, at step 203 the analysis engine receives input layout 201 and design rules 202. *Id.* at 5:63–66. The analysis engine evaluates the layout and design rules by determining distinct pattern types that “have different criticality leading to different manufacturability margin requirements.” *Id.* at 6:4–7. In step 204, certain pattern instances 206 are extracted. *Id.* at 6:17–18. Similarly, at step 205, localized design rules are produced that correspond to each extracted pattern instance. *Id.* at 6:18–20. At step 208, each pattern instance and localized design rule is selected for an evaluation of manufacturability indices at step 209. *Id.* at 6:20–23. At step 210, the results of calculating the manufacturability indices are compared against past tolerances 211. *Id.* at 6:30–31. In step 212, if the results are within the tolerances, the selected design rules are suitable for the given pattern instances. *Id.* at 6:31–34. The process then proceeds to step 214, where the layout is processed according to these selected design rules. *Id.* at 6:34–35. At step 213, if more refinement is needed, the process returns to step 203 for further analysis. *Id.* at 6:35–39.

Figure 9 of Kroyan, reproduced below, illustrates a flow diagram of an intelligent analysis and optimization resolution enhancement technique in accordance with another embodiment. Ex. 1006, 4:62–64.

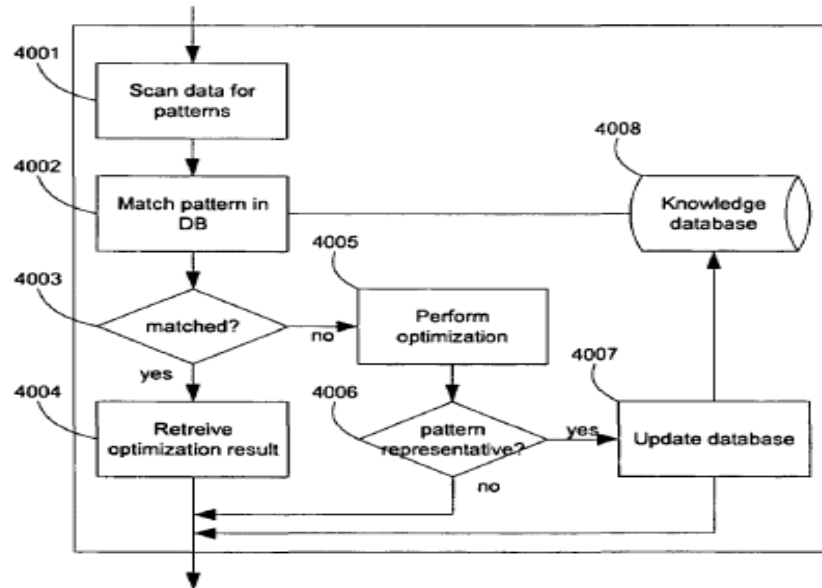


Figure 9

Figure 9 of Kroyan, reproduced above, illustrates that, at step 4001, the input design layout first is scanned and, at step 4002, the output layout patterns are compared against data stored in database 4008. *Id.* at 9:1–5. At step 4003, if a match is found, an optimization result is retrieved at step 4004. *Id.* at 9:6–7. At step 4005, if a match is not found, then a decision is made whether to store the results in the database at step 4006. *Id.* at 9:7–11. If the results are stored, database 4008 is updated at step 4007. *Id.* at 9:11–12.

2. Claims 4 and 6–8

IYM does not address separately RPX's explanations and supporting evidence as to how the teachings of Allan and Kroyan account for the limitations of dependent claims 4 and 6–8. *See generally* PO Resp. 47–52. We have reviewed RPX's explanations and supporting evidence regarding these dependent claims, and we agree with and adopt RPX's analysis showing that the combined teachings of Allan and Kroyan account for all the limitations recited in dependent claims 4 and 6–8. *See* Pet. 64–71. RPX,

therefore, has shown, by a preponderance of the evidence, that the subject matter of dependent claims 4 and 6–8 is unpatentable over Allan and Kroyan.

3. Claim 9

Claim 9 depends from independent claim 1, and further recites “wherein the step of computing local process modification comprises searching a look-up data table.” Ex. 1001, 8:63–65.

In its Petition, RPX contends that the ’012 patent states that a “local process modification value” for adjusting a layout constraint can be determined from either simulation or using “look-up data tables” that store “pattern recognition.” Pet. 71 (citing Ex. 1001, 5:1–6:2; Ex. 1002 ¶ 456). RPX argues that Kroyan’s knowledge database may be used to retrieve an “associated remedial solution” that could be provided to an optimizer. *Id.* (citing Ex. 1006, 9:1–7, 10:46–58, 11:55–12:3). According to RPX, Kroyan’s “associated remedial solution” that is provided to the optimizer constitutes the “local process modification,” recited in independent claim 1. *Id.* (citing Ex. 1002 ¶¶ 457–460). In the Allan and Kroyan combination, RPX argues that Kroyan’s knowledge database would be used to identify a value for an LDR to be applied and, therefore, teaches the limitation of dependent claim 9. *Id.* (citing Ex. 1002 ¶ 461).

Turning to the rationale to combine the teachings of Allan and Kroyan, RPX contends that it would have been obvious to a person of ordinary skill in the art to generate a knowledge database, as taught by Kroyan, to facilitate the analysis of the layout and GDRs, and eventual application of the LDRs, as taught by Allan. Pet. 61 (citing Ex. 1002 ¶ 421). According to RPX, developing a knowledge database is a simple design

choice for using a particular data structure that achieves the predictable result of being able to “**best capture** known problematic patterns and apply the appropriate treatment.” *Id.* (quoting Ex. 1006, 8:6–8) (citing Ex. 1002 ¶ 421)).

In its Response, IYM argues a person of ordinary skill in the art would have no motivation to combine the teachings of Kroyan with those of Allan to result in the limitation of dependent claim 9. PO Resp. 47–52. In particular, IYM argues a POSA would have no motivation to combine Kroyan’s purported “lookup data table” with Allan’s local design rules. *Id.* at 47 (citing Ex. 2012 ¶ 142). According to IYM, Dr.’s Nagel’s statement that a POSA would know how to make the combination is insufficient, as it does not indicate why a POSA would be motivated to make the combination. *Id.* at 48–49 (citing Ex. 1002 ¶¶ 461, 421; Ex. 2012 ¶ 143; Pet. 60–61; *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1068–69 (Fed. Cir. 2018) (improper to “focus[] on what a skilled artisan would have been *able* to do, rather than what a skilled artisan would have been *motivated* to do at the time of the invention”)). IYM argues RPX’s reliance on a “simple design choice” is conclusory. *Id.* at 49 (citing Ex. 1006 8:6–8; Ex. 1002 ¶ 421; Pet. 61).

According to IYM, Allan discloses three LDRs and there would be no reason to resort to Kroyan’s knowledge database, which includes a large amount of data storing a comprehensive set of problematic patterns and associated remedial solutions. *Id.* at 49–51 (citing Ex. 1006 11:66–12:2; Ex. 2013, 170:12–15, 170:17–20, 172:1–2, 172: 9–21, 172:22–173:6; Ex. 2012 ¶ 144). IYM argues Kroyan’s knowledge database serves a purpose not relevant to Allan, as Kroyan needs a database of storing and

quickly accessing a “comprehensive set” of unique “problematic patterns” and their associated remedial solutions.” *Id.* at 50–51 (citing Ex. 1006, 11:65–12:2; Ex. 2013 172:1–7; Ex. 2012 ¶ 145). IYM argues that Dr. Nagel agreed that Allan’s three LDRs apply to all metal tracks in the layout and, therefore, a POSA would not look to Kroyan’s knowledge database to select an LDR based on wire and contact geometry patterns, “because the **same** LDRs would apply to **every** geometry pattern.” *Id.* at 51–52 (citing Ex. 2013, 173:23–175:12; Pet. 60; Ex. 2012 ¶¶ 146, 147).

In its Reply Brief, RPX argues that Allan searches for instances of local non-optimal layout and applies LDRs to adjust the layout, and a POSA would have reason to use a lookup table like Kroyan’s (which includes images of non-optimal layouts and solutions to them) to identify non-optimal portions of Allan’s layout and to provide LDRs to address these non-optimal layouts, because doing so simply applies Kroyan’s known technique for achieving these results, and it would have been an obvious design choice to implement in Allan. Pet. Reply 24 (citing Pet. 59–64). According to RPX, developing a knowledge database is a simple design choice for using a particular data structure that achieves the predictable result of being able to “**best capture** known problematic patterns and apply the appropriate treatments.” *Id.* at 25 (quoting Ex. 1006, 8:6–8) (citing Pet. 60–61; Ex. 1002 ¶ 421). RPX additionally argues the lookup table would store a different value to assign to the LDR for different non-optimal configurations. *Id.*, citing Pet. at 59–64. RPX argues IYM’s assertion that Allan uses only three LDRs is wrong as Dr. Nagel testified that there are “three types of LDR’s,” not “only three LDR’s,” and Dr. Nagel testified there would be thousands of LDRs in Allan. *Id.* at 25 (citing PO Resp. 50;

Ex. 2013, 172:22–173:6). According to RPX, Allan does not teach that every instance of a type of LDR must share the same value because different values for the same type of LDR (e.g., for increasing track width) may be applied to different areas of the layout, and a lookup table, as taught by Kroyan, was an obvious way to store predefined LDR values for different nonoptimal local layout conditions. *Id.* at 25–26 (citing Pet. 59–64).

In its Sur-Reply, IYM argues RPX did not address IYM’s assertion that Allan teaches width LDRs generally apply 1.5x minimum spacing throughout the layout, regardless of the shape and form of the patterns. PO Sur-Reply 10 (citing PO Resp. 51–52; Ex. 1015, 1360). IYM additionally argues that RPX’s new assertion that a “lookup table would store **a different value** to assign to the LDR for different non[-] optimal configuration’ is not present in the Petition and it is not supported by any evidence.” *Id.*

Based on the record developed during trial, RPX has shown sufficiently that one of ordinary skill in the art would have combined the teachings of Allan and Kroyan. We credit Dr. Nagle’s testimony that Allan and Kroyan each are directed to locally adjusting global constraints to improve yield because this is consistent with their respective disclosures. Ex. 1002 ¶ 418. We also credit Dr. Nagle’s testimony that “[a] POSA would have known to generate a knowledge database, as disclosed in Kroyan, in order to facilitate the analysis of the layout and GDRs, and ultimate application of the LDRs, as disclosed in Allan,” because “developing a knowledge database is no more than a simple design choice of using a particular data structure that achieves the predictable result of being able to

‘**best capture** known problematic patterns and apply the appropriate treatment.’” *Id.* at ¶ 421 (citing Ex. 1006, 8:6–8).

As stated by the Supreme Court, an obviousness determination must be based on

some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. . . . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

KSR., 550 U.S. at 418 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Here, the skilled artisan would “be able to fit the teachings of multiple patents together like pieces of a puzzle” since the skilled artisan is “a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. at 420–21. Based upon the teachings of Allan and Kroyan identified above, using Kroyan’s knowledge database to store Allan’s different values assigned to the LDR for different non-optimal configurations is likely to be obvious when it does no more than yield predictable results. *See id.* at 415–16. Moreover, as discussed *supra*, RPX provided persuasive reasons why one of ordinary skill in the art would combine Allan and Kroyan in the manner suggested—namely, to ‘**best capture** known problematic patterns and apply the appropriate treatment.’” Ex. 1006, 8:6–8 (emphasis added).

In view of the above, we determine Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 9 is unpatentable over Allan and Kroyan.

D. Constitutional Challenge

IYM contends that the Supreme Court’s decision in *Oil States Energy Services, LLC v. Greene’s Energy Group, LLC*, 138 S. Ct. 1365 (2018) was limited to addressing *Oil States*’s constitutional challenge that subjecting its patent to an *inter partes* review proceeding violates its right to a jury trial under the Seventh Amendment of the U.S. Constitution. PO Resp. 52–53. IYM noted that that Supreme Court emphasized that its *Oil States* decision “should not be misconstrued as suggesting that patents are not property for purposes of the Due Process Clause or the Takings Clause.” *Id.* (quoting *Oil States*, 138 S. Ct. at 1379).

IYM contends that our exercise of jurisdiction to adjudicate the patentability of the ’012 patent would violate its rights under the Takings Clause of the Fifth Amendment of the U.S. Constitution, because this patent issued in November 2008, several years prior to the enactment of the America Invents Act (“AIA”). PO Resp. 53. According to IYM, the retroactive nature of this *inter partes* review proceeding underscores the unconstitutionality of the entire process. *Id.* IYM also argues that subjecting the ’012 patent to an *inter partes* review proceeding “places a severe, disproportionate, and extremely retroactive burden on” IYM. *Id.* (quoting *E. Enters. v. Apfel*, 524 U.S. 498, 538 (1998)).

RPX counters in its Reply that IYM does not offer any substantive analysis to support its argument that subjecting the ’012 patent to an *inter partes* review proceeding violates IYM’s rights under the Takings Clause. Pet. Reply 26. RPX further contends that IYM does not cite to any authority

that would authorize the Board to determine that the “retroactive” application of the AIA is unconstitutional. *Id.*

We decline to consider IYM’s constitutional challenge because “administrative agencies [generally] do not have jurisdiction to decide the constitutionality of congressional enactments.” *See Riggin v. Office of Senate Fair Employment Practices*, 61 F.3d 1563, 1569 (Fed. Cir. 1995); *see also Harjo v. Pro-Football, Inc.*, 50 USPQ2d 1705, 1710 (TTAB 1999) (“[T]he Board has no authority . . . to declare provisions of the Trademark Act unconstitutional.”), *rev’d on other grounds*, 284 F. Supp. 2d 96 (D.D.C. 2003). *But see Am. Express Co. v. Lunenfeld*, Case CBM2014-00050, slip op. at 9–10 (PTAB May 22, 2015) (Paper 51) (“[F]or the reasons articulated in *Patlex [Corp. v. Mossinghoff]*, 758 F.2d 594 (Fed. Cir. 1985)], we conclude that covered business method patent reviews, like reexamination proceedings, comply with the Seventh Amendment.”).

III. CONCLUSION

We conclude that RPX demonstrates, by a preponderance of the evidence, that (1) claims 1–5, 11, 13, and 14 are unpatentable under 35 U.S.C § 103(a) over Allan and (2) claims 4 and 6–9 are unpatentable under 35 U.S.C § 103(a) over Allan and Kroyan. RPX, however, has not demonstrated by a preponderance of the evidence that claim 10 is unpatentable under 35 U.S.C § 103(a) over Allan.

IV. ORDER

Accordingly, it is

ORDERED that claims 1–9, 11, 13, and 14 of the ’012 patent are held to be unpatentable;

FURTHER ORDERED that it has not been demonstrated that claim 10 of the '012 patent is unpatentable; and

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.

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Patent 7,448,012 B1

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