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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* JONATHAN DUNNE, MORTEN KRISTIANSEN, JEFFREY B. SLOYER, and IAN D. STEWARD

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Appeal 2018-009110  
Application 14/024,711<sup>1</sup>  
Technology Center 2100

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Before MARC S. HOFF, LINZY T. McCARTNEY, and MATTHEW J. McNEILL, *Administrative Patent Judges*.

HOFF, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from a Final Rejection of claims 1–9. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

Appellants' invention concerns risk assessment for a computer system. User input specifies a proposed topology for the computer system, the topology defined by a first software product to be used and an

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<sup>1</sup> Appellants state that the real party in interest is IBM Corporation. App. Br. 1.

architecture having a first non-functional component. A problem knowledge repository is searched for records of problems correlated with the proposed topology. A level of risk in implementing the computing system using the proposed topology is calculated. *See* Abstract.

Claim 1 is reproduced below:

1. A method, comprising:
  - receiving a user input specifying a proposed topology for a computing system, wherein the proposed topology is defined by a first software product to be used and an architecture having a first non-functional component;
  - searching, using a processor, a problem knowledge repository for records of problems correlated with the proposed topology; and
  - calculating, using the processor, a level of risk in implementing the computing system using the proposed topology according to the searching.

Claims 1–9 stand rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter.

Claims 1, 5, and 7–9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gaa-Frost (US 2007/0157195 A1, July 5, 2007) and Poddar (US 2011/0161952 A1, June 30, 2011).

Claims 2–4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gaa-Frost, Poddar, and Ciccirelli (US 2003/0037327 A1, Feb. 20, 2003).

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Gaa-Frost, Poddar, and Lau (US 2003/0229890 A1, Dec. 11, 2003).

Throughout this decision, we make reference to the Appeal Brief (“App. Br.,” filed May 14, 2008), the Reply Brief (“Reply Br.,” filed Sept.

25, 2018), and the Examiner's Answer ("Ans.," mailed July 25, 2018) for their respective details.

### ISSUES

1. Is the claimed invention directed to an abstract idea?
2. Does the claimed invention integrate the recited abstract idea into a practical application?
3. Does the claimed invention recite additional elements that are not well-understood, routine, and conventional?
4. Does the combination of Gaa-Frost and Poddar teach or suggest calculating a level of risk in implementing a computing system using a proposed topology defined by an architecture having a first non-functional component?
5. Does the combination of Gaa-Frost and Poddar teach or suggest a proposed topology defined by a plurality of nodes and a communication link between at least two of the plurality of nodes?
6. Does the combination of Gaa-Frost, Poddar, and Cicciarelli teach or suggest determining an alternative topology for the computing system having a lower level of risk than the proposed topology?

### PRINCIPLES OF LAW

An invention is patent-eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101.

However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: "[l]aws of nature, natural phenomena, and abstract ideas" are not patentable. *See, e.g., Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014).

In determining whether a claim falls within an excluded category, we are guided by the Supreme Court’s two-step framework, described in *Mayo* and *Alice*. *Id.* at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is “directed to.” *See Alice*, 573 U.S. at 219 (“On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.*, the use of a third party to mitigate settlement risk.”); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) (“Claims 1 and 4 in petitioners’ application explain the basic concept of hedging, or protecting against risk.”).

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 69 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as “molding rubber products” (*Diamond v. Diehr*, 450 U.S. 175, 192 (1981)); “tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores” (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1853))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that “[a] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula.” *Diehr*, 450 at 176; *see also id.* at 191 (“We view

respondents' claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula.”). Having said that, the Supreme Court also indicated that a claim “seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, . . . and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment.” *Id.* (citing *Benson* and *Flook*); *see, e.g., id.* at 187 (“It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.”).

If the claim is “directed to” an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where “we must examine the elements of the claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Alice*, 573 U.S. at 221 (citation and quotation marks omitted). “A claim that recites an abstract idea must include ‘additional features’ to ensure ‘that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].’” *Id.* (quoting *Mayo*, 566 U.S. at 77). “[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention.” *Id.*

The PTO recently published revised guidance on the application of § 101. USPTO’s January 7, 2019 Memorandum, *2019 Revised Patent Subject Matter Eligibility Guidance* (“Memorandum”). Under that guidance, we first look to whether the claim recites:

- (1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing

human interactions such as a fundamental economic practice, or mental processes); and

(2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h)).

Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look to whether the claim:

(3) adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional” in the field (*see* MPEP § 2106.05(d)); or

(4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

*See* Memorandum.

## ANALYSIS

### SECTION 101 REJECTION

With regard to subject matter eligibility, Appellants make a unitary argument directed to all pending claims. App. Br. 7-13. Accordingly, we select independent claim 1 as representative of the rejected claims.

Claim 1 recites the following limitations, in pertinent part:

- (a) receiving a user input specifying a proposed topology for a computer system;
- (b) searching (using a processor) a problem knowledge repository for records of problems correlated with the proposed topology; and

(c) calculating (using the processor) a level of risk in implementing the computing system using the proposed topology.

These limitations, under the broadest reasonable interpretation, constitute steps to gather data concerning a computer system topology, determine whether records exist indicating problems with that proposed topology, and perform a calculation of a “level of risk” in actually implementing that proposed computer system topology. The claim limitations recite operations that would be involved in deciding whether to implement a proposed computer system topology.

The Memorandum recognizes that certain groupings of subject matter have been found by the courts to constitute judicially excepted abstract ideas: (a) mathematical concepts, (b) certain methods of organizing human activity, and (c) mental processes. Memorandum, 84 Fed. Reg. at 52. Mental processes include steps that people can perform in their minds or using pen and paper. *See, e.g., CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1372 (Fed. Cir. 2011) (determining that a claimed method was drawn to “unpatentable mental processes” when the method’s steps could “be performed in the human mind, or by a human using a pen and paper”). This is true even when the claim recites that a computer component performs steps that otherwise encompass a mental process. *Versata Dev. Grp., Inc. v. SAP Am., Inc.*, 793 F.3d 1306, 1335 (Fed. Cir. 2015) (“Courts have examined claims that required the use of a computer and still found that the underlying, patent-ineligible invention could be performed via pen and paper or in a person’s mind.”).

We determine that the claimed limitations of searching a problem knowledge repository for records of problems correlated with a proposed

topology, and calculating a level of risk in implementing a computer system with that proposed topology, constitute such a mental process. Reviewing reports of problems having to do with a particular topology, and determining therefrom a level of risk in implementing said topology, constitute concepts that could be performed in the human mind, or by a human being using pen and paper. The incidental recitation here of a “processor” is of no moment; if a claim, under its broadest reasonable interpretation, covers performance in the mind but for the recitation of generic computer components, then it is still in the mental processes category unless the claim cannot practically be performed in the mind. *See Versata*, 793 F.3d at 1335; Memorandum, 84 Fed. Reg. at 52 n.14.

With specific reference to the “calculating” limitation, a person can calculate the level of risk in implementing the computing system using the proposed topology by mentally evaluating the pertinent records of problems retrieved in the previous data-gathering “searching” step.

Appellants argue that the Examiner erred in concluding that the claims recite an abstract idea by mischaracterizing the holding of *Electric Power Group*. App. Br. 11. Appellants contend that *Electric Power Group* does not apply because of Appellants’ allegedly “inventive technology involving the calculating of a level of risk in implementing a particular computing [topology].” App. Br. 11–12. Appellants further argue that the claimed invention is patent-eligible due to the “topology . . . defined by a first software product to be used and an architecture having a first non-functional component” being “not previously employed by the prior art.” App. Br. 12.

Last, Appellants assert that the claimed invention sets forth not merely a result, but “a particular way of achieve (sic) this result.” *Id.*

We do not agree with Appellants that *Electric Power Group* lacks analogy to the invention under appeal. The representative claim in *Electric Power Group* recited, *inter alia*, “receiving a plurality of data streams” of particular data types, “receiving data from other power system data sources” of enumerated types, detecting and analyzing events in real-time from the plurality of data streams, displaying event analysis results, accumulating and updating measurements, and deriving a composite indicator of vulnerability that is an indicator of power grid vulnerability and is derived from a combination of one or more real time measurements. *Electric Power Group*, 830 F.3d at 1351–52. The invention under appeal recites analogous limitations: “receiving a user input specifying a proposed topology for a computer system,” i.e., receiving data; “searching . . . a problem knowledge repository for records of problems correlated with the proposed topology,” analogous to both receiving data and to detection and analysis; and “calculating . . . a level of risk in implementing the computer system,” which corresponds to deriving a composite indicator of vulnerability.

The court in *Electric Power Group* found that the focus of the asserted claims is on collecting information, analyzing it, and displaying certain results of the collection and analysis. *Id.* at 1353. Just as in *Electric Power Group*, the focus of the invention under appeal is on collecting information (a proposed topology and prior problem reports), analyzing it (correlating prior reports with the proposed topology), and “displaying” results, i.e., determining a risk level, just as *Electric Power Group* derived a composite indicator of vulnerability. Just as the *Electric Power Group* concluded that

the claims focus on an abstract idea, we conclude that the invention under appeal is directed to a mental process, i.e., an abstract idea.

Appellants' argument that a "topology . . . defined by a first software product to be used and an architecture having a first non-functional component" is not previously employed by the prior art is an argument pertinent to anticipation and obviousness, but not pertinent to the distinct inquiry into subject matter eligibility under § 101. App. Br. 12.

Accordingly, we conclude that the claims recite a mental process of, subsequent to gathering customer input and pertinent data, calculating a level of risk in implementing a computer system using a proposed topology. A mental process is one of the categories of abstract ideas recognized in the Memorandum. 84 Fed. Reg. at 52. We thus conclude that the claims recite an abstract idea.

#### INTEGRATED INTO A PRACTICAL APPLICATION

We next evaluate whether the claims integrate the identified abstract idea, of determining the level of risk in implementing a computing system according to a proposed topology, into a practical application. *See* Memorandum, 84 Fed. Reg. at 51. We consider whether there are any additional elements beyond the abstract idea that, individually or in combination, "integrate the [abstract idea] into a practical application, using one or more of the considerations laid out by the Supreme Court and the Federal Circuit." *Id.* at 54–55.

The Revised Guidance Memorandum provides exemplary considerations that are indicative that an additional element may have integrated the exception (i.e., the abstract idea recited in the claim) into a practical application:

- (i) an improvement to the functioning of a computer;
- (ii) an improvement to another technology or technical field;
- (iii) an application of the abstract idea with, or by use of, a particular machine;
- (iv) a transformation or reduction of a particular article to a different state or thing; or
- (v) other meaningful limitations beyond generally linking the use of the abstract idea to a particular technological environment.

*See* Memorandum, 84 Fed. Reg. at 55; MPEP § 2106.05(a)–(c), (e)–(h).

Appellants’ argument that the claims are “directed to an inventive technology involving the calculating of a level of risk in implementing a particular computing [system]” are not persuasive. App. Br. 12. Appellants cite no evidence in support of the allegation that the invention under appeal constitutes an improvement in *technology*. We determine Appellants’ purported “inventive technology” to constitute an advance in the underlying *abstract idea* of calculating risk. The abstract idea itself cannot provide a practical application of the abstract idea. *Cf. Trading Techs. Int’l, Inc. v. IBG LLC*, 921 F.3d 1084, 1093 (Fed. Cir. 2019) (“The abstract idea itself cannot supply the inventive concept, ‘no matter how groundbreaking the advance.’” (quoting *SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1170 (Fed. Cir. 2018))). As the court held concerning the invention in *Electric Power Group*, the “advance” of the invention under appeal is not to “any particular assertedly inventive technology for performing” the functions of gathering and analyzing information of a specified content. *Id.* at 1354.

We determine that the claimed “receiving a user input specifying a proposed topology,” and the claimed searching for (and, therefore, identification and retrieval of) records of problems correlated with the

proposed topology, amount to data-gathering steps which we consider to be insignificant extra-solution activity. *See* MPEP § 2106.05(g).

The recitation of “a processor” does not constitute application with a particular machine such that the claimed abstract idea is integrated into a practical application. The “processor” at issue is claimed as a generic element having no specific characteristics. Appellants’ Specification discloses the processor only as being the “processor of a general purpose computer, special purpose computer, or other programmable data processing apparatus.” Spec. ¶ 17. System 100, of which processor 105 forms a part, “is implemented as a computer or other programmable data processing apparatus that is suitable for storing and/or executing program code. . . . [S]ystem 100 can be implemented in the form of any system including a processor and memory that is capable of performing and/or initiating the functions and/or operations described.” Spec. ¶ 22.

As the court concluded in *Electric Power Group*, limiting the claims under appeal to the technological environment of determining the risk involved in implementing a computer system topology is insufficient to transform the claims into patent-eligible applications of the abstract idea embedded therein. *See Electric Power Group*, 830 F.3d at 1354. “Merely requiring the selection and manipulation of information . . . does not transform the otherwise-abstract processes” of data gathering, comparison with similar records, and calculation of a level of risk. *See id.* at 1355.

We conclude that the claims do not recite additional elements that integrate the recited abstract idea, of calculating the level of risk in implementing a particular computer system topology, into a practical

application under the considerations laid out by the Supreme Court and the Federal Circuit.

#### INVENTIVE CONCEPT

Last, we consider whether claims 1–9 express an inventive concept, i.e., whether any additional claim elements “transform the nature of the claim’ into a patent-eligible application.” *Alice*, 573 U.S. at 217 (quoting *Mayo*, 566 U.S. at 78, 79). This requires us to evaluate whether the additional claim elements add “a specific limitation or combination of limitations that are not well-understood, routine, [and] conventional activity in the field” or “simply append[] well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality.” Memorandum, 84 Fed. Reg. at 50, 56.

Appellants have not presented argument that any additional claim elements add a specific limitation or combination of limitations that are not well-understood, routine, and conventional. As discussed *supra* with regard to integration into a practical application, we find that the additional element of a “processor” is generically recited and disclosed. Accordingly, we conclude that the claims under appeal do not express an inventive concept that would transform the nature of the claim into a patent-eligible application of the recited abstract idea.

#### PREEMPTION

In response to Appellants’ argument (App. Br. 9) that the claims do not pre-empt all applications of the abstract idea of calculating a level of risk involved in implementing a particular computing system topology, we note that lack of preemption will not demonstrate patent eligibility. “Where a patent’s claims are deemed only to disclose patent ineligible subject matter

under the *Mayo* framework, as they are in this case, preemption concerns are fully addressed and made moot.” *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015).

#### SUBJECT MATTER ELIGIBILITY - CONCLUSION

We conclude that the claims recite a process of calculating a level of risk in implementing a computing system under a proposed topology, which we determine to constitute a mental process, found by the courts to constitute an abstract idea.

We further conclude that the claims do not integrate the identified abstract idea into a practical application.

We further conclude that the claims do not recite any additional elements that add a limitation or combination of limitations that are not well-understood, routine, and conventional.

Accordingly, we sustain the Examiner’s 35 U.S.C. § 101 rejection of claims 1–9.

#### OBVIOUSNESS REJECTION OF CLAIMS 1 AND 7–9

Appellants argue that the Examiner erred in rejecting independent claim 1. According to Appellants, the Examiner found that Gaa-Frost does not teach calculating a level of risk in implementing the computing system using the proposed topology, which includes an architecture having a first non-functional component. App. Br. 14.

Appellants further contend that Poddar fails to suggest that it would have been obvious to modify Gaa-Frost to include an architecture having a non-functional component. App. Br. 17. Appellants assert that the Examiner has not expressed a reason for combining the references having a rational

underpinning. App. Br. 18. Appellants argue that the Examiner has misrepresented the scope and content of Poddar in that Poddar allegedly does not explicitly describe a topology configuration or describe that middleware specifications are an important parameter in such a configuration. App. Br. 19.

We do not agree with Appellants' argument. We agree with the Examiner that Gaa-Frost teaches a deployment risk calculator that calculates a deployment risk associated with the configuration state data that characterizes the configuration state of the software. Ans. 8; Gaa-Frost ¶ 45. Configuration parameters may include hardware specifications, network specifications, operating systems, processor types. Gaa-Frost ¶ 23. The Examiner admits that Gaa-Frost does not expressly disclose an architecture having a first non-functional component. Ans. 8. Poddar is cited for its teaching of creating a topology model by selecting (inputting) a middleware unit. We agree with the Examiner that it would have been obvious to modify Gaa-Frost to incorporate input specifying a proposed topology definition including an architecture having a non-functional component, so that incompatibilities between components in a topology can be identified and corrected. Ans. 9; Poddar ¶¶ 52, 107.

Appellants' arguments against the references individually are not persuasive to establish error in a rejection based upon a combination of references. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981). Appellants' complaint that Poddar does not address calculation of risk level, so thus Poddar is not relevant to the limitations at issue, is thus unpersuasive. Reply Br. 5. Gaa-Frost, rather than Poddar, is relied upon for a teaching of calculation of risk level. Final Act. 7. Appellants' contention that Gaa-Frost

does not teach calculation of risk for a proposed topology including an architecture having a first non-functional component, is similarly unpersuasive. App. Br. 14. The Examiner proposes to *combine* Gaa-Frost’s teaching of calculating a level of risk with Poddar’s teaching of an architecture having a non-functional component, and supplies a rationale for combining the references having a rational underpinning.

We conclude that the Examiner did not err in combining Gaa-Frost and Poddar to obtain the invention under appeal. We sustain the Examiner’s § 103(a) rejection of claims 1 and 7–9.

#### CLAIM 5

Claim 5 recites that the proposed topology is further defined by a plurality of nodes and a communication link between at least two of the plurality of nodes. Appellants’ argument that the Examiner has not presented evidence that the topology of the small computer system “plays any role in how the deployment risk is calculated” is not persuasive. App. Br. 22. Figure 2 of Gaa-Frost illustrates a topology having a plurality of nodes, interconnected by communication links. Gaa-Frost explains calculating deployment risk “from the perspective of starting with a small computing system and deploying the system 201 that is shown in FIG. 2.” Ans. 9; Gaa-Frost ¶ 39. Gaa-Frost further describes running “a tool to initially assess

deployment risk associated with installing the ERP software 216 in the computing system 201.” Gaa-Frost ¶ 41.

We conclude that the Examiner did not err in combining Gaa-Frost and Poddar to obtain the invention recited in claim 5. We sustain the Examiner’s § 103(a) rejection of claim 5.

#### OBVIOUSNESS REJECTION OF CLAIMS 2–4

Claim 2 depends from independent claim 1, and claims 3 and 4 depend from claim 2. Claim 2 recites “determining an alternative topology for the computing system having a lower level of risk than the proposed topology.”

In rejecting claim 2, the Examiner found that Gaa-Frost teaches the recited limitation, in that “Paragraph 0026 teaches the method determines whether the calculated deployment risk level is less than a threshold risk level, established statistically or through experience.” Final Act. 11; Gaa-Frost ¶ 26.

Appellants argue that the Examiner erred in rejecting claim 2 because Gaa-Frost teaches comparing a calculated deployment risk level with a threshold risk level, and does not teach an alternate topology for the computing system having a lower level of risk than the proposed topology for the computing system. App. Br. 24. We agree with Appellants. We find that Gaa-Frost’s “threshold risk level” does not correspond to the risk level

of any alternate topology, but is simply a risk level determined to be “reasonable.”

Thus, we find that the combination of Gaa-Frost, Poddar, and Cicciarelli fails to teach all the limitations of claims 2–4. We do not sustain the Examiner’s § 103(a) rejection.

#### OBVIOUSNESS REJECTION OF CLAIM 6

Claim 6 depends from claim 5, and ultimately from independent claim 1. Appellants argue only that Lau does not cure the deficiencies of Gaa-Frost and Poddar. App. Br. 27. As we discuss *supra*, we are unpersuaded that such deficiencies exist. Accordingly, we sustain the § 103(a) rejection of claim 6 over Gaa-Frost Poddar, and Lau, for the reasons given *supra* with respect to claim 5.

#### CONCLUSIONS

1. The claimed invention is directed to an abstract idea, specifically a mental process.
2. The claimed invention does not integrate the recited abstract idea into a practical application.
3. The claimed invention does not recite additional elements that are not well-understood, routine, and conventional.
4. The combination of Gaa-Frost and Poddar suggests calculating a level of risk in implementing a computing system using a proposed topology defined by an architecture having a first non-functional component.
5. The combination of Gaa-Frost and Poddar suggests a proposed topology defined by a plurality of nodes and a communication link between at least two of the plurality of nodes.

6. The combination of Gaa-Frost, Poddar, and Cicciarelli fails to teach or suggest determining an alternative topology for the computing system having a lower level of risk than the proposed topology.

**ORDER**

The Examiner's decision to reject claims 1–9 under 35 U.S.C. § 101 is affirmed. The Examiner's decision to reject claims 1 and 5–9 under 35 U.S.C. § 103(a) is affirmed. The Examiner's decision to reject claims 2–4 under 35 U.S.C. § 103(a) is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv) (2017).

**AFFIRMED**