Trials@uspto.gov
571.272.7822

Paper No. 44
Entered: October 15, 2020

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICROSOFT CORPORATION,
Petitioner,

v.

IPA TECHNOLOGIES, INC.,
Patent Owner.

Case IPR2019-00813
Patent 6,851,115 B1

Before LYNNE E. PETTIGREW, MINN CHUNG, and KEVIN C. TROCK, *Administrative Patent Judges.*

TROCK, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Denying Patent Owner's Motion to Exclude
35 U.S.C. § 318(a); 37 C.F.R. § 42.64

I. INTRODUCTION

We have authority to hear this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision issues pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed herein, we determine that Microsoft Corporation ("Petitioner") has shown, by a preponderance of the evidence, that claims 1–3, 11, and 48–60 (the "challenged claims") of U.S. Patent No. 6,851,115 B1 (Ex. 1001, "the '115 patent") are unpatentable. *See* 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

A. Procedural History

Petitioner filed a request for *inter partes* review of the challenged claims of the '115 patent. Paper 1 ("Pet." or "Petition"). IPA Technologies, Inc. ("Patent Owner") filed a Preliminary Response, Paper 6 ("Prelim. Resp."), contending the Petition should be denied as to all challenged claims.

On October 17, 2019, the Board entered a decision instituting an *inter partes* review of all claims and all grounds presented in the Petition. Paper 12 ("Inst. Dec.").

After institution, Patent Owner filed a Response to the Petition. Paper 22 ("Resp."). Petitioner thereafter filed a Reply to Patent Owner's Response. Paper 30 ("Reply"). Patent Owner filed a corrected Sur-reply to Petitioner's Reply. Paper 40 ("Sur-reply"). An oral hearing was held on July 27 and 28, 2020. A transcript of the hearing is included in the record. Paper 43 ("Tr.").

B. Related Proceedings

Petitioner states that the '115 patent is the subject of the following actions: *IPA Technologies Inc. v. Google LLC*, 1-18-cv-00318 (D. Del.) filed

February 26, 2018; *IPA Technologies Inc. v. Microsoft Corporation*, 1-18-cv-00001 (D. Del.) filed January 2, 2018; and *IPA Technologies Inc. v. Amazon.com, Inc. et al.*, 1-16-cv-01266 (D. Del.) filed December 19, 2016. Pet. 3.

Petitioner lists four other petitions (IPR2019-00810, IPR2019-00811, IPR2019-00812, IPR2019-00814) filed by Petitioner against the '115 patent. *Id.* at 2–3.

Petitioner also lists IPR petitions it has filed against other family members of the '115 patent (IPR2019-00835, IPR2019-00836, and IPR2019-00837 (U.S. Patent No. 7,069,560 B1); IPR2019-00838, IPR2019-00839, and IPR2019-00840 (U.S. Patent No. 7,036,128 B1)). *Id.* at 2–3.

Petitioner also identifies numerous IPR petitions filed by Google against the '115 patent and family members of the '115 patent (IPR2019-00728, IPR2019-00729, IPR2019-00730, IPR2019-00731, IPR2019-00732, IPR2019-00733, IPR2019-00734, IPR2019-00735, IPR2019-00736). *Id.* at 2.

C. The '115 Patent (Ex. 1001)

The '115 patent describes software-based architectures for communication and cooperation among distributed electronic agents. Ex. 1001, 1:28–29. The '115 patent describes an architecture that supports cooperative task completion by flexible, dynamic configurations of autonomous electronic agents. *Id.* at 4:60–62. Service-providing agents declare their capabilities, and facilitator's broker communication and cooperation between the agents, such as by matching requests with descriptions of capabilities. *Id.* at 4:63–66, 5:6–7.

Figure 3 of the ’115 patent, shown below, depicts a distributed agent system in accordance with one embodiment.

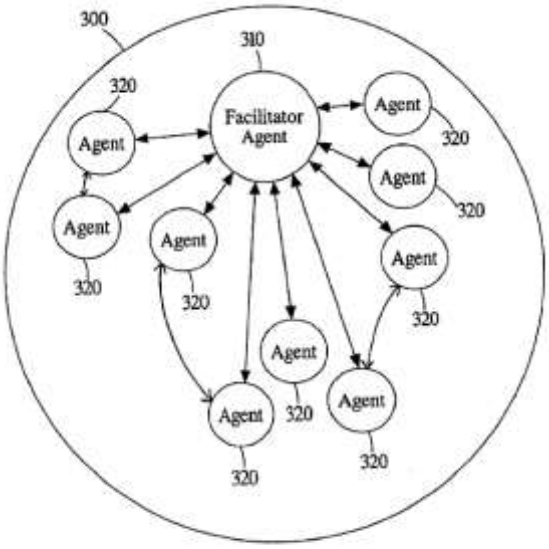


Fig. 3

Figure 3, above, shows a distributed agent system 300 that includes a plurality of agents 320 based around a facilitator agent 310. *Id.* at 6:3–6. “The agents 320 forward service requests to the facilitator agent 310,” which “interprets these requests, organizing a set of goals which are then delegated to appropriate agents for task completion.” *Id.* at 6:10–13.

Figure 4 of the ’115 patent is reproduced below.

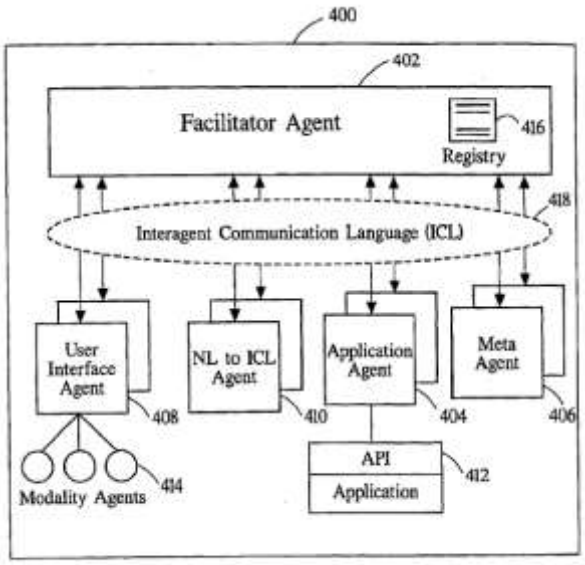


Fig. 4

Figure 4, above, depicts the structure of a small system 400 including user interface agents 408, several application agents 404 and meta-agents 406, organized as a community of peers by their common relationship to a facilitator agent 402. *Id.* at 6:25–30. The facilitator 402 is a specialized server agent that is responsible for coordinating agent communications and cooperative problem-solving and may also provide a global data store for its client agents, allowing them to adopt a blackboard style of interaction. *Id.* at 6:32–37. Agents register with a parent facilitator a specification of the capabilities and services that the agent can provide. *Id.* at 7:18–20. During task completion, when a facilitator determines that the registered services 416 of one of its client agents will help satisfy a goal, the facilitator sends that client a request expressed in the Interagent Communication Language (ICL) 418. *Id.* at 7:25–30. The agent parses the request, processes it, and returns answers or status reports to the facilitator. *Id.* at 7:30–32.

The Specification provides an express definition for "Interagent Communication Language": "Interagent Communication Language ('ICL') 418 refers to an interface, communication, and task coordination language

preferably shared by all agents, regardless of what platform they run on or what computer language they are programmed in." *Id.* at 10:48–53.

Figure 7 of the '115 patent is reproduced below.

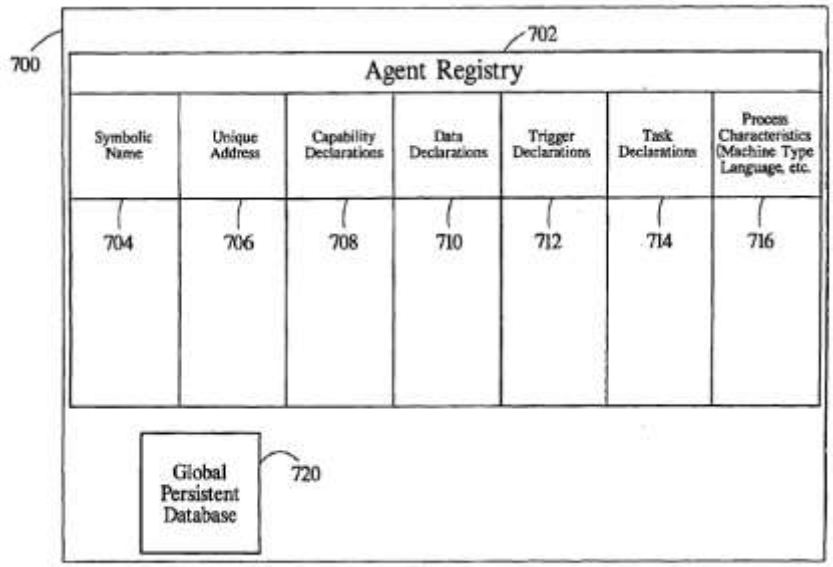


Fig. 7

Figure 7, above, shows data structures 700 internal to a facilitator including an agent registry 702. Each registered agent may be optionally associated with one or more capabilities, which have associated Capability Declaration fields 708. The '115 patent discloses that "[t]hese capabilities may define not just functionality, but may further provide a utility parameter indicating, in some manner (e.g., speed, accuracy, etc.), how effective the agent is at providing the declared capability." *Id.* at 16:65–17:2.

D. Challenged Claims

Petitioner challenges claims 1–3, 11, and 48–60 of the '115 patent. Pet. 3. Claims 1 and 48 are independent. Claim 1 reads as follows.

> 1. [(a)] A computer-implemented method for communication and cooperative task completion among a plurality of distributed electronic agents, comprising the acts of:

> [(b)(i)] registering a description of each active client agent's functional capabilities as corresponding registered functional capabilities,
> [(b)(ii)] using an expandable, platform-independent, inter-agent language,
> [(c)(i)] wherein the inter-agent language includes: a layer of conversational protocol
> [(c)(ii)] defined by event types
> [(c)(iii)] and parameter lists associated with one or more of the events,
> [(c)(iv)] wherein the parameter lists further refine the one or more events;
> [(d)] a content layer comprising one or more of goals, triggers and data elements associated with the events;
> [(e)(i)] receiving a request for service as a base goal in the inter-agent language,
> [(e)(ii)] in the form of an arbitrarily complex goal expression;
> [(f)] and dynamically interpreting the arbitrarily complex goal expression,
> [(g)] said act of interpreting further comprising: generating one or more sub-goals expressed in the inter-agent language;
> [(h)(i)] constructing a goal satisfaction plan wherein the goal satisfaction plan includes:
> [(h)(ii)] a suitable delegation of sub-goal requests to best complete the requested service request
> [(h)(iii)] by using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms;
> [(i)] and dispatching each of the sub-goals to a selected client agent for performance, based on a match between the sub-goal being dispatched and the registered functional capabilities of the selected client agent.

Ex. 1001, 29:10–44 (numbering and formatting designated by Petitioner; *see* Pet. Att. C).

E. Prior Art References

Petitioner relies upon the following prior art references:

(1) U.S. Patent No. 6,484,155, issued Nov. 19, 2002 ("Kiss") (Ex. 1005);

(2) 1997 FIPA v. 1.0 Specification ("FIPA97") (Ex. 1006–1012);

Petitioner also relies on the Declaration of Dr. Henry Lieberman. Ex. 1003.

F. Asserted Ground of Unpatentability

Ground	Reference(s)	Basis	Claims Challenged
1	Kiss/FIPA97	§ 103	1–3, 11, 48–60

II. ANALYSIS

A. Level of Ordinary Skill

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). "The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry." *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991).

Petitioner describes a person of ordinary skill in the art as "someone familiar with the principles and conventions of computer science and computer networking, and also with multi-agent systems and inter-agent communication languages as documented in agent-centered literature by 1999." Pet. 4. Petitioner also explains that a person of ordinary skill in the art "may have been a graduate student in mathematics, engineering, or computer science, and may have had an advanced degree in one of these

disciplines, and would also have had at least two years of experience working in the field of computer science, or a related field, and may have worked in academia, either as a professor or a graduate student, for a technology company, or for a government." Pet. 4–5 (citing Ex. 1003 ¶ 34).

In its Response, Patent Owner asserts that a person of ordinary skill in the art at the time of the '115 patent's filing date would have had "a Bachelor's degree in Computer Science or equivalent field and at least two years of work experience in design and development of distributed systems, software specification languages, or a related area." Resp. 23 (citing Ex. 2032 ¶ 37). Patent Owner criticizes Petitioner's description of the level of ordinary skill in the art as being "vague and uncertain" as to render it "meaningless" because of the use of the word "may" in its description. *Id.* Patent Owner contends that Petitioner's proposed description is "particularly problematic here, where Petitioner claims that it would have been obvious to create an agent system that is very complex and advanced in its facilitation, goal processing, and inter-agent communication capacities." *Id.* at 24 (citing Ex. 2032 ¶ 40).

In its Reply, Petitioner argues that its proposal "simply (and realistically) expresses alternatives—*i.e.*, that a Skilled Artisan would have been at least a graduate student in several relevant fields (*e.g*, 'mathematics, engineering, or computer science'), and would have had at least two years of work experience in those fields." Reply 13–14 (citing Pet. 4–5). Petitioner also argues that Patent Owner does not articulate how any differences between the parties' proposals that would alter or even affect the outcome of this proceeding. Reply 14.

In its Sur-reply, Patent Owner argues that it has "identified how the difference between the proposals would affect this proceeding" because

Patent Owner has pointed out that "it is Petitioner's burden under the law to address each *Graham* factor and Petitioner has failed to proffer a coherent level of ordinary skill in the art, Petitioner's obviousness assertion fails for that reason alone." Sur-reply 15 (citing Resp. 24).

Patent Owner, however, does not identify any "meaningful differences" between the parties' proposed definitions or how "the outcome of [this proceeding] would have been different" if we adopted Patent Owner's proposed description, as opposed to Petitioner's proposal. *See ESIP Series 2, LLC v. Puzhen Life USA, LLC*, 958 F.3d 1378, 1385 (Fed. Cir. 2020) (citing *Genzyme Therapeutic Prod. Ltd. P'ship v. Biomarin Pharm. Inc.*, 825 F.3d 1360, 1371–72 (Fed. Cir. 2016)). For example, Patent Owner does not argue the challenged claims are not unpatentable under Patent Owner's proposed description of the level of ordinary skill in the art, nor does Patent Owner identify any claim limitation that would have been taught by the asserted prior art under Petitioner's proposal, but *not* under Patent Owner's proposal. *See* Resp. 23–24; Sur-reply 14–16.

In our view, the parties' proposals are not materially different despite the differences in wording between them (e.g., the education level of a Bachelor's degree in Computer Science or equivalent field under Patent Owner's proposal, as opposed to a graduate student's level of education with or without a Bachelor's degree under Petitioner's proposal). For purposes of this Final Written Decision, we find no meaningful differences between the parties' respective proposals that would materially alter the outcome of this Decision. These proposals are similar for all purposes relevant to this Final Written Decision, and both are consistent with the level of ordinary skill in the art reflected in the disclosure of the '115 patent and the prior art of

record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995).

Nonetheless, for this Final Written Decision, we adopt Patent Owner's description of a person of ordinary skill in the art at the time of the claimed invention. That is, a person of ordinary skill in the art at the time of the claimed invention would have had "a Bachelor's degree in Computer Science or equivalent field and at least two years of work experience in design and development of distributed systems, software specification languages, or a related area." Our analysis and conclusions in this Final Written Decision would be the same regardless of whether Petitioner's or Patent Owner's description of the level of ordinary skill in the art is adopted.

B. Claim Construction

In an *inter partes* review, we apply the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2019). In applying such standard, claim terms are generally given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. "In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence." *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

In our Decision on Institution, we preliminarily interpreted certain claim terms as follows.

Term	Construction
"event"	"a message or goal communicated between agents"
"event type"	"a type of an event"
"goal"	"a request for service"
"arbitrarily complex goal expression"	"a goal expressed in a language or syntax that allows an expression, when appropriate or when desired, that expresses multiple sub-goals and can potentially include more than one type of logical connector (e.g., AND, OR, NOT), and/or more than one level of logical nesting (e.g., use of parentheses), or the substantive equivalent, although not every goal is itself necessarily complex"
"compound goal"	"a single goal expression that specifies multiple sub-goals to be performed"

Dec. on Inst. 27–36.

The parties do not dispute the constructions of these terms in the Patent Owner Response or Petitioner Reply. *See* Resp. 25–27; Reply 1. Upon considering the complete record, we discern no reason to deviate from our preliminary constructions and, therefore, adopt the constructions of the claim terms "event," "event type," "goal," "arbitrarily complex goal expression," and "compound goal" as set forth above for this Final Written Decision.

In the Petition, Petitioner discusses constructions for additional claim terms, including "goal satisfaction plan," "layer of conversational protocol," "content layer," "trigger," and "parameter lists further refine the one or more

events." Pet. 8–16. In addition, in the Petitioner Reply, Petitioner discusses construction of the claim term "process characteristics." Reply 12–13. Patent Owner disputes constructions for two terms, "goal satisfaction plan" and "process characteristics." *See* Resp. 24–38; Sur-reply 13–14. We discuss constructions for each of the two disputed terms in turn below.

Patent Owner does not discuss Petitioner's proposed construction for the claim term "parameter lists further refine the one or more events" or proposes its own construction for the term. *See* Resp. 24–38. Nonetheless, Patent Owner discusses meaning of this term in the context of Patent Owner's arguments that FIAP97 does not teach an "expandable . . . inter-agent language" and "parameter lists" that "further refine the one or more events," as recited in claim 1. *See id.* at 97–106. Although Patent Owner's arguments raise an issue of claim construction, Patent Owner's arguments are closely related to and interspersed with Patent Owner's arguments that FIPA97 does not teach an "inter-agent language" recited in claim 1. Thus, for efficiency and completeness, we address this issue in the context of the patentability discussion below.

No other claim terms need to be construed expressly for purposes of this Final Written Decision. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (holding that only terms that are in controversy need to be construed, and "only to the extent necessary to resolve the controversy"); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (applying *Vivid Techs.* in the context of an *inter partes* review).

1. "goal satisfaction plan"

The claim term "goal satisfaction plan" is recited in all but one of independent claims of the '115 patent—claims 1, 29, 61, 71, and 86, the one exception being claim 48. *See* Ex. 1001, 29:33–40 (claim 1), 32:9–21 (claim 29), 35:24–29 (claim 61), 36:17–23 (claim 71), 37:22–38:5 (claim 86). "[W]e presume, unless otherwise compelled, that the same claim term in the same patent or related patents carries the same construed meaning." *Paice LLC v. Ford Motor Co.*, 881 F.3d 894, 904 (Fed. Cir. 2018) (quoting *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1334 (Fed. Cir. 2003). The parties do not contend that the term "goal satisfaction plan" has different meanings in different claims of the '115 patent. *See* Pet. 10; Resp. 27–38; Reply 1–12; Sur-reply 2–13.

Petitioner contends that a "goal satisfaction plan" is a "procedure for sending one or more requests for service to one or more agents in order to satisfy a goal." Pet. 10. Patent Owner disagrees and asserts that the claim term "goal satisfaction plan" should be construed to mean "a plan for the satisfaction of a complex goal expression in an optimal or near-optimal manner that is consistent with any advice parameters or constraints." Resp. 28.

a. Claim Language

We begin our claim construction analysis by considering the language of the claims themselves. *Phillips*, 415 F.3d at 1314. Addressing the claim language of the disputed term, we note that the claim language "a goal satisfaction plan" indicates that the term's plain meaning is "a plan for satisfying a goal."

In the challenged independent claims 1 and 29, the term "goal satisfaction plan" is further limited (in different ways) by specific limitations recited in the claims. For example, claim 1 recites:

constructing a goal satisfaction plan wherein *the goal satisfaction plan includes*:

a suitable delegation of sub-goal requests to *best complete* the requested service request—by using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms;

Ex. 1001, 29:32–39 (emphases added). In contrast, claim 29 recites:

constructing a base *goal satisfaction plan including the sub-acts of*:

determining whether the request service is available,

determining sub-goals required in completing the base goal by using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms,

selecting service-providing electronic agents from the agent registry suitable for performing the determined sub-goals, and

ordering a delegation of sub-goal requests complete the requested service;

Id. at 32:9–21 (emphasis added).

As shown above, the "optimal or near-optimal"[1] limiting feature argued by Patent Owner is recited in claim 1 ("a suitable delegation of

[1] Patent Owner asserts that the term "optimal" and "near optimal" has a well-established meaning in the context of computer engineering, citing a technical dictionary, which defines optimization as "[t]he process of finding

sub-goal requests to *best complete* the requested service request"), but not in claim 29. This shows that the patentee knew how to restrict the "goal satisfaction plan" to "best complete the requested service request," i.e., satisfy a goal "in an optimal or near-optimal manner." If the patentee had intended to similarly restrict the "goal satisfaction plan" in claim 29, it could have done so using the language of claim 1, but did not. *See Intellectual Ventures I LLC v. T-Mobile USA, Inc.*, 902 F.3d 1372, 1379 (Fed. Cir. 2018) (citing *Unwired Planet, LLC v. Apple Inc.*, 829 F.3d 1353, 1359 (Fed. Cir. 2016)).

Thus, Patent Owner's proposed construction that generally requires a "goal satisfaction plan" to satisfy a goal "in an optimal or near-optimal manner" would have the effect of obfuscating the material differences in the claim language of claim 1 and claim 29 discussed above.

In addition, for claim 1, Patent Owner's proposed construction would render the limitation "suitable delegation of sub-goal requests to best complete the requested service request" recited in claim 1 superfluous. Such a construction is presumed improper. *See Digital-Vending Servs. Int'l, LLC v. Univ. of Phoenix, Inc.*, 672 F.3d 1270, 1274–75 (Fed. Cir. 2012) (rejecting the district court's construction narrowing a term by a superfluous limitation when the claims explicitly recited the narrowing limitation, and discussing the "well-established rule that claims are interpreted with an eye toward giving effect to all terms in the claim") (quoting *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950 (Fed. Cir. 2006)) (internal quotation marks omitted); *LSI Indus., Inc. v. ImagePoint, Inc.*, 279 F. App'x 964, 972 (Fed. Cir. 2008)

---

the best solution to some problem, where 'best' accords to prestated criteria." Sur-reply 6 (emphasis added) (citing Ex. 2078, 3).

(nonprecedential) (rejecting the district court's construction of "display device" as necessarily including the superfluous limitation of "internal illumination" because other claim terms specifically recited an "illuminated display device"); *but cf. ERBE Elektromedizin GmbH v. Canady Tech. LLC*, 629 F.3d 1278, 1286 (Fed. Cir. 2010) ("no canon of [claim] construction is absolute in its application") (citation omitted).

Considering next the Patent Owner-argued the limiting feature of satisfying a goal "consistent with any advice parameters or constraints," this feature is recited in claim 29, but not in claim 1. Claim 29 recites "the act of interpreting including the sub-acts of: determining any task completion *advice* provided by the base goal, and determining any task completion *constraints* provided by the base goal" (Ex. 1001, 32:4–8 (emphases added)), whereas claim 1 does not recite "advice" or "constraint" (*see id.* at 29:10–44). Thus, Patent Owner's proposed construction is disfavored because it would blur the material differences in the claim language of claim 1 and claim 29 discussed above.

Finally, Patent Owner's proposed construction replaces "goal" with "complex goal expression." Again, this feature is recited in claim 1, but not in claim 29. Claim 1 recites "receiving a request for service as a base goal in the inter-agent language, in the form of an arbitrarily complex goal expression; and dynamically interpreting the arbitrarily complex goal expression" (Ex. 1001, 29:25–30), whereas claim 29 recites "interpreting a service request in order to determine a base goal that *may be* a compound, arbitrarily complex base goal" (*id.* at 31:59–61) (emphasis added). Because of the permissive language "may be" used in claim 29, a "goal" is not necessarily required to be in the form of an arbitrarily complex goal expression in claim 29. Again, Patent Owner's proposed construction is

disfavored because it would blur the material differences in the claim language of claim 1 and claim 29 discussed above.

Thus, at least based on the claim language, it is not appropriate to limit "goal satisfaction plan" as Patent Owner contends. As discussed above, the meaning and the scope of "goal satisfaction plan" is clear on the face of each claim because claims 1 and 29 each recite specifically what a "goal satisfaction plan" includes or comprises in different claims. Therefore, absent compelling evidence to the contrary, it is neither necessary nor appropriate to limit the meaning of the term "goal satisfaction plan" beyond the plain meaning indicated by the claim language—i.e., "a plan for satisfying a goal."

b. Written Description

Turning to the Specification, Patent Owner cites the following statement in the "Summary of the Invention" section:

[e]xtreme flexibility is achieved through an architecture organized around the declaration of capabilities by service-providing agents, the construction of arbitrarily complex goals by users and service-requesting agents, and the **role of facilitators in delegating and coordinating the satisfaction of these goals, subject to advice and constraints** that may accompany them.

Resp. 31 (quoting Ex. 1001, 5:3–9). The very first sentence of the paragraph cited by Patent Owner states, however, "[a] first *embodiment* of the present invention discloses a highly flexible, Software-based architecture for constructing distributed systems." Ex. 1001, 4:58–60 (emphasis added). Indeed, all of the portions of the Specification cited by Patent Owner, including the passage reproduced above, describe various embodiments of

the '115 patent. *See* Resp. 30–33 (citing Ex. 1001, 5:3–9, 5:48–49, 15:37–39, 15:66–16:1, 16:11–21, 16:38–46, 18:35–48, 28:47–54, Fig. 11).

In general, "a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment." *SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) (citation omitted). As discussed above, the challenged independent claims 1 and 29 do not recite all of the limiting features required by Patent Owner's proposed construction of "goal satisfaction plan." Thus, unless one of the established exceptions, such as lexicography or disavowal, applies, the challenged claims are not restricted as Patent Owner contends. *See, e.g.*, *GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) ("the specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal") (citation omitted). Here, Patent Owner does not argue lexicography or disavowal. Nor does Patent Owner explain any other reason why the Specification limits "goal satisfaction plan" as it contends. Thus, claim construction in this case is governed by the general principle that "a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment." *SuperGuide*, 358 F.3d at 875; *see also WesternGeco LLC v. ION Geophysical Corp.*, 889 F.3d 1308, 1323–24 (Fed. Cir. 2018) ("It is well established that claims are not limited to preferred embodiments, unless the specification clearly indicates otherwise." (citing *Comaper Corp. v. Antec, Inc.*, 596 F.3d 1343, 1348 (Fed. Cir. 2010) ("[T]his court has repeatedly cautioned against limiting claims to a preferred embodiment."))). Accordingly, none of the embodiments in the Specification cited by Patent Owner limits "goal satisfaction plan" as Patent Owner contends.

c. Prosecution History

Turning next to the prosecution history, Patent Owner asserts that "examples in the file history confirm the elements of 'goal satisfaction plan' reflected in Patent Owner's proposed construction." Resp. 35–36. Patent Owner argues, during the prosecution of the application for the '115 patent,

> Applicant further stated that "the facilitating engine is able to use reasoning to delegate the sub-goals to service providing agents in such a way as '**to best complete the requested service request**.'…The facilitating engine is able to use reasoning to delegate the sub-goal task of roasting coffee to the service-providing agent that can roast beans in the least amount of time because the facilitating engine has reasoned that the least amount of time taken to make coffee is the best way to accomplish the base goal of making coffee." Applicant concluded that "the base goal is carried out **not by merely parsing the request into sub-goals**" but rather "the facilitating engine used reasoning to decide upon using **competing** message transfer agents to reminding Bob of lunch, in lieu of delegating the task to just one message transfer agent."

Id. at 35 (citing Ex. 1002, 172–173). As discussed above, however, the limiting feature argued by Patent Owner is recited in claim 1 ("a suitable delegation of sub-goal requests to *best complete* the requested service request"), but not in claim 29. Thus, Patent Owner's argument is unpersuasive for the same reasons discussed above.

d. Extrinsic Evidence

Patent Owner also cites the testimony of its declarant, Dr. Medvidovic, in support of Patent Owner's proposed construction of "goal satisfaction plan." Resp. 36–37 (citing Ex. 2032 ¶¶ 51–52, 54–59,

129). We have reviewed the cited testimony from Dr. Medvidovic, but do not find anything in his testimony that would change our analysis based on intrinsic record discussed above. *See Phillips*, 415 F.3d at 1318 (authorizing the consideration of extrinsic evidence in determining the meaning of claims but noting that it is "in general . . . less reliable than the patent and its prosecution history in determining how to read claim terms").

e. Other Arguments

The parties dispute whether Petitioner's use of "procedure" (in place of a "plan") and "sending one or more requests for service" in Petitioner's proposed construction is appropriate. *See* Resp. 37–38; Reply 2–4, 11–12; Sur-reply 3, 13. We need not address these arguments in detail because, for the reasons discussed above, we see no reason to depart from the plain meaning of the term "goal satisfaction plan."

f. Conclusion

Based on the complete record and after examining the claims as a whole, the Specification, and the prosecution history, we construe the term "a goal satisfaction plan" according to its plain meaning—"a plan for satisfying a goal."

C. Patentability Challenges

Petitioner asserts claims 1–3, 11 and 48–60 are unpatentable as obvious under 35 U.S.C. § 103 over the combination of Kiss and FIPA97. Pet. 32–85. Claims 1 and 48 are independent.

Petitioner argues that FIPA97 provides a common communications protocol and language (FIPA ACL) between the agents of Kiss, and also adds its administrative functionality and exemplary practices to the Kiss

system. Pet. 28–29. Petitioner explains, "[t]hese techniques are used to implement the functionality described in Kiss, including facilitating agent collaboration, agent registry, and inter-agent messaging." *Id.* at 28 (citing Ex. 1005, 3:32–36, 3:67–4:1, 6:67–7:1). Petitioner asserts, "[w]here the two systems disclose analogous functionality, such as facilitating cooperation and agent registry, their techniques are combined, as a Skilled Artisan would understand that to be an efficient and common sense way to implement the combined system in order to obtain the benefits of both, and therefore be motivated to do so." *Id.* (citing Ex. 1003 ¶¶ 217–219).

1. Principles of Law on Obviousness

To prevail in challenging Patent Owner's claims, 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).

Section 103(a) forbids issuance of a patent when "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." Obviousness is a question of law based on

underlying factual findings, including: (1) the level of ordinary skill in the art; (2) the scope and content of the prior art; (3) the differences between the claims and the prior art; and (4) secondary considerations of nonobviousness, such as commercial success, long-felt but unmet needs, failure of others, and unexpected results. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007); *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17–18 (1966).

The Supreme Court has made clear that we apply "an expansive and flexible approach" to the question of obviousness. *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415 (2007). Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *KSR*, 550 U.S. at 417. Reaching this conclusion, however, requires more than a mere showing that the prior art includes separate references covering each separate limitation in a claim under examination. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness requires the additional showing that a person of ordinary skill at the time of the invention would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention. *Id.*

2. Prior Art

a. Kiss (Ex. 1005)

Kiss describes "a knowledge management system that supports inquiries of distributed knowledge resources," as illustrated in Figure 1 below. Ex. 1005, 2:44–45.

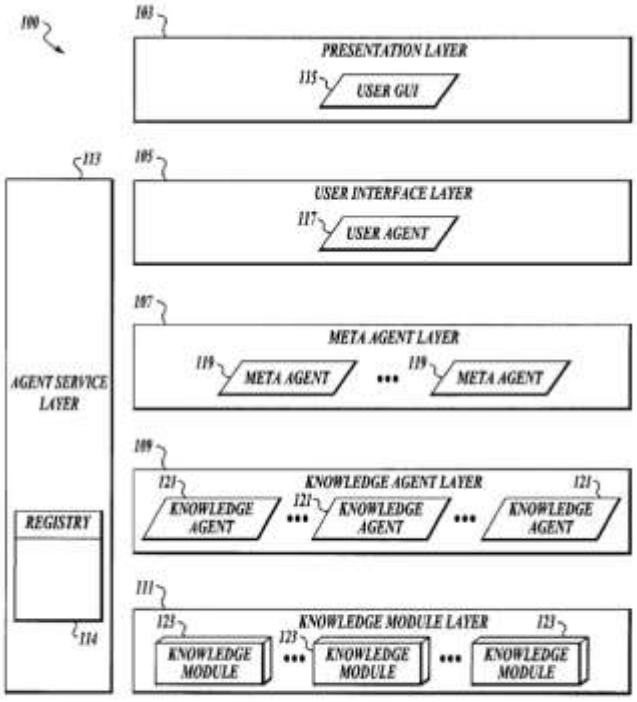


Fig. 1

Kiss' Figure 1, above, is a conceptual overview of one embodiment of a knowledge management system. *Id.* at 5:1–2. Kiss' knowledge management system 100 includes a presentation layer 103, a user interface layer 105, a meta agent layer 107, a knowledge agent layer 109, a knowledge module layer 111, and an agent service layer 113. *Id.* at 5:3–7.

The meta agent layer 107 includes one or more meta agents 119 that are responsible for analyzing queries or problem formulations provided by the user interface layer 105 and constructing a plan for finding a solution to the problem. *Id.* at 5:20–24. More specifically, "meta agent 119 is responsible for formulating a dynamic 'solution plan' for the distributed inferencing to be performed by the system 100, and allocates tasks to the knowledge agent layer 109 in furtherance of the solution plan." *Id.* at 5:33–37. "The meta agent solution plan attempts to employ all elements of

information contained in the parsed inquiry in the development of search-space constraints." *Id.* at 8:34–37.

The knowledge agent layer 109 includes multiple knowledge agents 121, each of which may be associated with one or more knowledge modules 123 in the knowledge module layer 111. *Id.* at 6:31–35. The knowledge agent 121 is configured to accept from a meta agent 119 a problem statement and convert that problem statement into a format appropriate for the knowledge module 123 associated with the knowledge agent 121. *Id.* at 6:35–38.

b. FIPA97 (Ex. 1006–1012)

FIPA97 (Exs. 1006–1012) is a specification created by the Foundation for Intelligent Physical Agents (FIPA) beginning in 1996 with an official release date in October 1997. Ex. 1006, Cover, iv (identifying specification as FIPA 97 Version 1.0 issued on October 10, 1997). FIPA97 is a "specification of basic agent technologies that can be integrated by agent systems developers to make complex systems with a high degree of interoperability." *Id.* at v. The specification comprises seven parts: three parts for basic agent technologies (Parts 1–3 relating to agent management, agent communication language, and agent/software integration) and four informative applications providing examples of how the technologies can be applied (Parts 4–7 describing personal travel assistance, personal assistant, audio-visual entertainment, and broadcasting and network management and provisioning applications). *Id.* at v–vii; *see generally* Exs. 1006–1008 (Parts 1–3); Exs. 1009–1012 (Parts 4–7).

Part 1 of FIPA97 "provides a normative framework within which FIPA compliant agents can exist, operate and be managed." Ex. 1006, vi.

Part 2 of FIPA97 describes an "Agent Communication Language (ACL)" that "is based on speech act theory: messages are actions, or communicative acts, as they are intended to perform some action by virtue of being sent." *Id.* The ACL specification "consists of a set of message types and the description of their pragmatics, [i.e.,] the effects on the mental attitudes of the sender and receiver agents." *Id.* The ACL specification "also provides the normative description of a set of high-level interaction protocols, including requesting an action, contract net and several kinds of auctions." *Id.*

Part 2 of FIPA97 discloses a "simple abstract model of inter-agent communication" including ACL messages having components as illustrated in Figure 1 below. Ex. 1007, 7, 12.

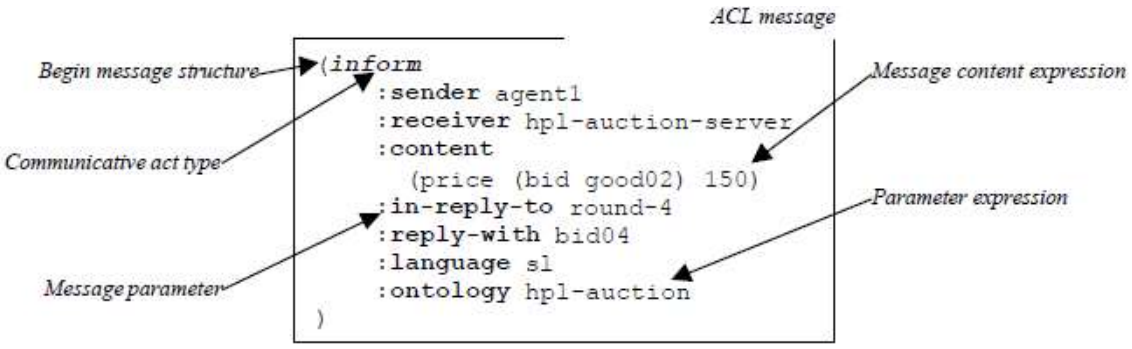


Figure 1 — Components of a message

Figure 1, above, illustrates the main structural elements of an ACL message in FIPA97. *Id.* at 12. "The first element of the message is a word which identifies the communicative act being communicated, which defines the principal meaning of the message." *Id.* Each ACL message contains a set of one or more parameters, including a mandatory "*:receiver*" parameter that identifies the intended recipient of the message. *Id.* at 13.

Petitioner asserts that FIPA97 was made publicly available as a single document and relies on FIPA97 as a single printed publication for purposes of 35 U.S.C. § 102(a). *See* Pet. 22; Pet. Reply 26. As discussed below in the section addressing the status of FIPA97 as a printed publication, FIPA approved and released FIPA 97 Version 1.0 as a single specification. *See infra* § II.E; Ex. 1026, 5; Ex. 1050 ¶ 165. Thus, although sometimes the seven parts are referred to as "documents," a person of ordinary skill in the art would have considered FIPA97 to be a single reference. *See* Ex. 1050 ¶¶ 164–165. Patent Owner does not dispute that FIPA97 is one reference for purposes of §§ 102 and 103. *See* Resp. 138–40.[2] Because FIPA and skilled artisans considered FIPA97 to be a single specification, we agree that FIPA97 constitutes a single prior art reference, and we treat it as such for purposes of our unpatentability analysis.

3. Prior Art Status Issues

Patent Owner challenges the prior art status of both Kiss and FIPA97.

c. Status of Kiss

Petitioner relies on Kiss as a prior art reference in all of the asserted grounds of unpatentability presented in the Petition. *See* Pet. 3–4. Petitioner has the burden of persuasion to prove unpatentability by a preponderance of the evidence. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1379 (Fed. Cir. 2015). Petitioner also has the initial burden of

[2] Contrary to Patent Owner's argument (Resp. 138–40), Petitioner did not argue in another case, and the Board did not find, that FIPA97 is seven separate prior art references. *See Microsoft Corp. v. IPA Techs. Inc.*, IPR2019-00838, Paper 13 at 3–5 (PTAB Apr. 3, 2020) (Decision Denying Petitioner Request for Rehearing), Paper 10 at 4–9 (Petitioner's Request for Rehearing, filed Dec. 6, 2019).

production to show that a reference is prior art to the challenged claims under a relevant section of 35 U.S.C. § 102. *See id.* Once Petitioner has met that initial burden, the burden of production shifts to Patent Owner to argue or produce evidence that the asserted reference is not prior art to the claims. *Id.* at 1380. Once Patent Owner has met that burden of production, the burden of production returns to Petitioner. *Id.*

The filing date of the '115 patent is January 5, 1999. Ex. 1001, code (22). As noted above, Kiss is a United States patent that arose from an application filed July 21, 1999, claiming the benefit of priority to a provisional application filed July 21, 1998. Ex. 1005, codes (22), (60).

Petitioner asserts that Kiss is prior art to the '115 patent under 35 U.S.C. § 102(e) because Kiss is entitled to the benefit of priority to the filing date of its provisional application (Ex. 1036, "Kiss Provisional Application"). Pet. 16–20. "A reference patent is only entitled to claim the benefit of the filing date of its provisional application if the disclosure of the provisional application provides support for the claims in the reference patent in compliance with § 112, ¶ 1." *Dynamic Drinkware*, 800 F.3d at 1381.

In *Ex parte Mann*, the Board held that "under *Dynamic Drinkware*, a non-provisional child can be entitled to the benefit of a provisional application's filing date if the provisional application provides sufficient support for *at least one claim* in the child." 2016 WL 7487271, at *6 (PTAB Dec. 21, 2016) (emphasis added) (discussing whether *Dynamic Drinkware* requires "support in the provisional . . . for all claims, any claim, or something in between"). In addition, the Board held that a "subject matter test" is also required—that is, "the [party claiming priority] also must show that the subject matter relied upon in the non-provisional is sufficiently

supported in the provisional application [and that t]his subject matter test is in addition to the comparison of claims required by *Dynamic Drinkware*." *Id*. at *5.

Recognizing these requirements, Petitioner asserts that "each element of [claim 1 of Kiss] has written description support in the Kiss Provisional," providing detailed citations to the supporting disclosures from the Kiss Provisional Application for each limitation of claim 1 of Kiss. Pet. 16–18. Addressing the "subject matter test," Petitioner asserts that "the teachings that Petitioner relies upon were carried forward from the Kiss Provisional to Kiss" and provides a detailed mapping of the relied-upon portions of Kiss to the corresponding portions of the Kiss Provisional Application. *Id*. at 18–20.

In the Institution Decision, we determined, based on the preliminary record, that Petitioner has presented sufficient argument and evidence to meet its initial burden of production on the issue of whether Kiss is entitled to the benefit of the filing date of the Kiss Provisional Application so as to shift the burden of production to Patent Owner to argue or produce evidence that Kiss is not prior art to the challenged claims. Inst. Dec. 25.

In its Preliminary Response, Patent Owner asserted that Kiss is not entitled to the priority date of its provisional application. Prelim. Resp. 66–67. In the Institution Decision, we determined, based on the preliminary record, the argument and evidence presented by Patent Owner was insufficient to shift the burden of production back to Petitioner. Inst. Dec. 25–27. We noted, however, a final determination on this particular issue will be made based on a full record developed during the course of trial. *Id.* at 27.

During the trial, Patent Owner did not present any argument or evidence on this issue, nor did it dispute Kiss qualifies as prior art in this proceeding. *See generally* Resp.

Based on the complete record, we determine that Petitioner has established by a preponderance of the evidence that Kiss is prior art to the '115 patent under 35 U.S.C. § 102(e) because Kiss is entitled to the benefit of priority to the filing date of its provisional application.

d. Status of FIPA97

Before reaching the merits of Petitioner's obviousness contentions, all of which are based in part on FIPA97 (Exhibits 1006–1012), we must determine as a threshold matter whether FIPA97 is a prior art printed publication under 35 U.S.C. § 102(a) or § 102(b). *See* Pet. 22–24. Petitioner bears the burden of establishing by a preponderance of the evidence that FIPA97 is a printed publication. *See* 35 U.S.C. § 316(e); *Nobel Biocare Servs. AG v. Instradent USA, Inc.*, 903 F.3d 1365, 1375 (Fed. Cir. 2018); *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29 at 11 (PTAB Dec. 20, 2019) (precedential) (citing *Nobel Biocare*, 903 F.3d at 1375). For purposes of instituting an *inter partes* review we accepted Petitioner's contention, unchallenged in Patent Owner's Preliminary Response, that FIPA97 was available as prior art as of October 1997, more than one year before January 5, 1999, the effective filing date of the '560 patent. Dec. 40–42. Patent Owner, however, challenges that contention in its Patent Owner Response, and the parties further address the issue in Petitioner's Reply and Patent Owner's Sur-reply. *See* Resp. 45–65; Pet. Reply 17–29; Sur-reply 20–35.

The determination of whether a document is a "printed publication" under 35 U.S.C. § 102 "involves a case-by-case inquiry into the facts and circumstances surrounding the reference's disclosure to members of the public." *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004). "Because there are many ways in which a reference may be disseminated to the interested public, 'public accessibility' has been called the touchstone in determining whether a reference constitutes a 'printed publication' . . . ." *Jazz Pharm., Inc. v. Amneal Pharm., LLC*, 895 F.3d 1347, 1355 (Fed. Cir. 2018) (quoting *In re Hall*, 781 F.2d 897, 898–99 (Fed. Cir. 1986)). A reference is considered publicly accessible if it was "disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it.'" *Id.* at 1355–56 (quoting *In re Wyer*, 655 F.2d 221, 226 (CCPA 1981)).

In the discussion below, we begin with background information regarding FIPA and an overview of the evidence submitted by Petitioner in support of its contention that FIPA97 was publicly accessible in October 1997. The evidence includes extensive testimony from Dr. Finin, a professor who has personal knowledge of FIPA's activities and the development process of FIPA97. *See* Ex. 1049 ¶¶ 1–55 (Finin Decl.). Dr. Finin was one of the first two FIPA Fellows invited to provide "high quality and independent advice to FIPA." *Id.* ¶ 18 (quoting Ex. 1076, 1); Ex. 1025, 1; Ex. 1062, 1. The evidence also includes testimony from Petitioner's expert witness, Dr. Lieberman, and more than sixty documentary exhibits on which Petitioner relies to show that FIPA97 was

publicly accessible in late 1997 and early 1998. *See* Ex. 1050 ¶¶ 142–149 (Lieberman Decl.); Exs. 1021–33, 1047, 1051–1105.

After providing an overview of the evidence, we consider the parties' arguments as to whether FIPA97 was publicly accessible before the January 5, 1999, critical date. For the reasons explained below, we determine that Petitioner has met its burden to show that FIPA97 was publicly accessible before the critical date.

i. FIPA

FIPA was a non-profit association based in Geneva, Switzerland, created to promote agent-based technology and develop open standards. Ex. 1006, iv (FIPA 97 Specification Version 1.0, Part 1, Foreword); Ex. 1049 ¶ 3. Founded in 1996, FIPA's membership included numerous technology companies, educational institutions, and governmental entities. Ex. 1049 ¶ 3. As of October 1997, FIPA had thirty-five corporate members representing twelve countries.[3] Ex. 1006, iv. According to FIPA documentation, membership was "open to any corporation and individual firm, partnership, governmental body or international organi[z]ation without restriction." *Id.* FIPA stated its intent "to make the results of its activities available to all interested parties." *Id.* Throughout its tenure, FIPA produced standards designed to promote and advance agent-based technology. Ex. 1049 ¶ 3. In 2005, FIPA was incorporated into the Institute of Electrical and Electronics Engineers (IEEE) as one of its standards committees. *Id.*

[3] The corporate members included Alcatel, British Telecommunications, Deutsche Telekom, France Telecom, Hitachi, Hewlett-Packard, IBM, NEC, NTT, Nortel, Siemens, and Toshiba. *See* Ex. 1095, 22.

ii. Development of FIPA97

The process of drafting the FIPA 97 specification began with FIPA's first meeting in London in April 1996. Ex. 1049 ¶ 6; Ex. 1058 (Main results of London meeting); Ex. 1066 (Resolutions of London meeting). Representatives from twenty-six companies and organizations attended. Ex. 1066, 1. At the meeting, the members agreed on FIPA's mission, drafted statutes and operational principles, and produced a work plan for a specification that would become FIPA 97. Ex. 1058, 1; Ex. 1066, 1–3; Ex. 1049 ¶ 6. The work plan set a December 1997 target for producing a first completed specification. Ex. 1066, 2–3; Ex. 1049 ¶ 7.

FIPA subsequently held several meetings in 1996 and 1997. At the second meeting in June 1996 in Yorktown Heights, NY, FIPA approved several documents, including a framework for FIPA activity and a list of requirements for FIPA-specified agent capabilities. Ex. 1067, 1 (Resolutions of Yorktown meeting); Ex. 1060, 1 (Results of Yorktown meeting); Ex. 1049 ¶ 9. At the third meeting in October 1996 in Tokyo, FIPA approved a final work plan calling for production of a FIPA specification in October 1997. Ex. 1049 ¶ 11; Ex. 1070, 1 (work plan); Ex. 1023 (Results of Tokyo meeting). Also at the Tokyo meeting, FIPA produced its First Call for Proposals, which outlined in detail three technology parts (corresponding to Parts 1–3 of FIPA 97) and four application parts (corresponding to Parts 4–7 of FIPA 97). Ex. 1069, 1–27 (First Call for Proposals); Ex. 1049 ¶ 12.

In 1997, FIPA began to produce draft specifications. At the fourth meeting in January 1997 in Turin, Italy, FIPA publicly released drafts of Parts 1–4 and posted them on the FIPA home page

(http://drogo.cselt.stet.it/fipa). Ex. 1021, 1 (Results of Turin meeting); Ex. 1049 ¶ 13. Additionally, FIPA released a Second Call for Proposals at the Turin meeting. Ex. 1071, 1–3 (Second Call for Proposals); Ex. 1049 ¶ 13. At the fifth meeting in April 1997 in Reston, VA, FIPA produced drafts of Parts 1–7, which were publicly released and posted on the FIPA home page. Ex. 1024 (Results of Reston meeting); Ex. 1061 (Resolutions of Reston meeting); Ex. 1049 ¶ 17. At the sixth meeting in June 1997 in Cheju Island, South Korea, FIPA publicly released revised drafts of Parts 1–7 and posted them on the FIPA home page. Ex. 1025, 1 (Results of Cheju meeting); Ex. 1062, 5 (Resolutions of Cheju meeting); Ex. 1049 ¶ 19. According to Dr. Finin, the Reston Draft and Cheju Draft were substantially complete versions of what would become FIPA 97. Ex. 1049 ¶¶ 17, 19.

Dr. Finin testifies that news of FIPA and its standardization efforts "spread quickly throughout the relatively small community of software agent researchers." Ex. 1049 ¶ 8. For instance, the AgentWeb website, "a meeting place for researchers in agent-based technology from 1995–2000," was home to a "Software Agents" mailing list and a newsletter that had more than 1,300 subscribers in 1996. *Id.*; Ex. 1089, 5. Dr. Finin was "the founder, author, and a subscriber" of the AgentWeb newsletter. Ex. 1049 ¶ 8. The widely distributed AgentWeb newsletters announced upcoming FIPA meetings, reported results of previous meetings, including calls for proposals, and provided links to the specification drafts posted on the FIPA home page. *See id.* ¶¶ 8, 10, 12, 14, 17, 19.

For example, the AgentWeb newsletter dated May 11, 1996, announced the upcoming FIPA June 1996 Yorktown meeting, described as the "FIPA Opening Forum." Ex. 1090, 5; Ex. 1049 ¶ 8. The purpose of the

meeting, as stated in the newsletter, was to "refine the list of basic agent capabilities candidate for FIPA specification; compile a first list of agent capabilities intended for specification by end 1997; and establish the first working groups." Ex. 1090, 5. Likewise, the AgentWeb newsletter dated August 12, 1996, advertised the FIPA October 1996 Tokyo meeting. Ex. 1088, 1; Ex. 1049 ¶ 10. Thereafter, the AgentWeb newsletter dated October 14, 1996, publicized the Call for Proposals issued at the October 1996 Tokyo meeting and provided the deadline for submission of proposals to be considered at the Turin meeting in January 1997. Ex. 1087, 1; Ex. 1049 ¶ 12. FIPA had decided that respondents who submitted proposals would be invited to the January 1997 meeting to present their proposals even if they were not FIPA members. Ex. 1023, 1; *see* Ex. 1069, 27.

Once FIPA began to produce drafts of the specification, AgentWeb newsletters announced those drafts and provided links to access them. The AgentWeb newsletter dated February 2, 1997, reported that "[i]nitial specifications for three technology parts (Agent Management, Agent Communication and Agent/Software Interaction) and one application part (Personal Travel Assistance) have been produced" at the recent Turin meeting. Ex. 1091, 1; Ex. 1049 ¶ 14. The newsletter included a freely accessible and public link to access the draft. Ex. 1049 ¶ 14 (citing Ex. 1091, 1–2). It also indicated that drafts of the remaining three specification parts would be generated at the FIPA meeting to be held in April 1997 in Reston. Ex. 1091, 1–2. A subsequent AgentWeb newsletter dated April 13, 1997, advertised the upcoming Reston meeting and

contained links to information about the meeting on the FIPA website. Ex. 1092, 3; Ex. 1049 ¶ 17.

On May 5, 1997, following the Reston meeting, an AgentWeb newsletter reported that attendees of that meeting produced a revised draft including all seven parts of the specification. Ex. 1093, 2; Ex. 1049 ¶ 17. The newsletter contained individual public links to the seven parts and invited "both members and non-members" to comment, providing an email address for submission. *Id.*; Ex. 1049 ¶ 17. Additionally, the newsletter announced the dates and locations of the next two meetings—the June 1997 Cheju meeting and the seventh meeting to take place in Munich on October 6–10, 1997. *Id.* Similarly, the AgentWeb newsletter dated June 30, 1997, announced that the Cheju meeting resulted in revised versions of the FIPA specification documents and provided direct links to the seven parts. Ex. 1094, 1–2; Ex. 1049 ¶ 19. Again, the newsletter stated that FIPA invited comments and that non-members making substantial comments would be invited to attend the October 1997 Munich meeting. Ex. 1094, 2. Dr. Finin was among those who submitted comments on the Cheju draft. Ex. 1073; Ex. 1049 ¶ 20.

Meanwhile, the AgentWeb Software Agents mailing list also provided information regarding FIPA's efforts to the community of software agent researchers. *See* Ex. 1049 ¶ 8. Dr. Finin was an organizer of and contributor to the Software Agents mailing list. *Id.* On May 2, 1996, a posting to the mailing list referenced the upcoming June 1996 FIPA meeting in Yorktown Heights, New York. Ex. 1079, 1; Ex. 1049 ¶ 8. Members of the Software Agents mailing list posted comments regarding the Turin draft after it was released publicly. Exs. 1078, 1081, 1082; *see* Ex. 1049 ¶¶ 14–

15. Dr. Finin was among those who shared their thoughts. *See* Ex. 1082; Ex. 1049 ¶ 15. A posting after the Reston meeting included a public and open link to access the Reston draft and invited comments from the mailing list. Ex. 1083, 1; Ex. 1049 ¶ 17.

iii. Public Release of FIPA97

FIPA's seventh meeting took place in Munich on October 6–10, 1997. Ex. 1026 (Resolution of Munich meeting); Ex. 1049 ¶ 20. At this meeting, FIPA incorporated final edits and comments and approved the FIPA 97 specification for publication. Ex. 1026, 1, 5; Ex. 1049 ¶ 20. The specification as approved at the meeting was called "FIPA 97 ver. 1.0," or FIPA 97 Version 1.0. Ex. 1026, 5. Working groups for various parts of the specification were given about one month to check for consistency and make minor edits. *Id.* at 2; Ex. 1049 ¶ 20.

An "initial" version of FIPA 97 Version 1.0, approved at the Munich meeting and dated October 10, 1997, was posted to the FIPA website, housed at the time at http://drogo.cselt.stet.it/fipa. Ex. 1049 ¶¶ 20–21. According to Dr. Finin, the specification documents were available online and free for anybody to access by sometime in October 1997. *Id.* ¶ 21. On November 18, 1997, an AgentWeb newsletter announced completion of FIPA 97 Version 1.0 and its publication on the FIPA website. Ex. 1086, 1–2; Ex. 1049 ¶ 21. The newsletter provided individual, direct links to the seven parts of the specification on the FIPA website. Ex. 1086, 1–2. The links were not password protected and were open to the public without a requirement for secrecy or confidentiality. Ex. 1049 ¶ 21. As with the earlier AgentWeb newsletters, the newsletter containing links to FIPA 97 Version 1.0 was sent to more than 1,300 subscribers. *Id.*

Dr. Finin testifies that in late 1997, "a few weeks after the Munich meeting," he accessed the approved FIPA 97 Version 1.0 posted on the FIPA website. *Id.* ¶¶ 20–21. He specifically recalls accessing the documents in late 1997 to review the first major work product of FIPA and to prepare for FIPA's upcoming January 1998 meeting in Palo Alto, which he attended. *Id.* ¶ 21 (citing Ex. 1074). Dr. Lieberman also testifies that he recalls FIPA 97 Version 1.0 being publicly available on the FIPA website throughout late 1997 and early 1998 and that he accessed it in late 1997 as a member of the interested public. Ex. 1050 ¶ 146.

The release of FIPA 97 Version 1.0 was well publicized in the weeks after the Munich meeting. Ex. 1049 ¶ 22. For example, on October 20, 1997, the EETimes featured an article reporting FIPA's approval of the FIPA 97 specification. Ex. 1095, 22; *see* Ex. 1049 ¶ 22. The article was based on an interview with Leonardo Chiariglione, the president of FIPA. Ex. 1095, 22. The article described the seven parts of the specification: "The first three parts cover different aspects of agent behavior: agent management; agent communication; and agent-software interaction. The four remaining parts, which cover application areas, . . . are: personal travel assistance; personal assistant; audio-visual entertainment and broadcast; and network provision and management." *Id.* After describing FIPA's plans for 1998, including testing of FIPA 97 Version 1.0 to provide input for a further round of standardization, the article referred readers to the FIPA website for information regarding the released specification: "CSELT[4] maintains

[4] Centro Studi e Laboratori Telecommunicazioni, Dr. Chiariglione's employer at the time. *See* Ex. 1095, 22.

extensive information on FIPA's activities at www.cselt.stet.it/fipa."[5] *Id.* (emphasis omitted). It concluded with a quote from Dr. Chiariglione regarding the specification's public availability: "'It is our policy to make the standard freely available over the Internet,' Chiariglione said. 'FIPA will retain the copyright but it will be free for others to use.'" *Id.*

The November-December 1997 issue of IEEE Internet Computing also announced the release of the FIPA 97 specification: "The Foundation for Intelligent Physical Agents, a non-profit organization established to promote emerging agent-based applications, has released its first specification. Named FIPA 97, the specification will provide a benchmark for interoperable products." Ex. 1096, 93; Ex. 1049 ¶ 22. The news brief directed readers to the FIPA website for the text of the specification. Ex. 1096, 93 ("The text is available at http://drogo.cselt.stet.it.fipa/."[6]); Ex. 1049 ¶ 22.

Sometime after the Munich meeting, FIPA also produced a hardcopy book version of the FIPA 97 Version 1.0 specification to be sent to FIPA members and various institutions and standards groups. Ex. 1049 ¶ 24; *see* Ex. 1026, 1; Ex. 1063, 1 (Resolution of the Palo Alto meeting, Jan. 29, 1998). At least two copies of the book were available in libraries in January 2019. Ex. 1049 ¶ 24; Ex. 1057, 1 (WorldCat catalog entry for "Fipa specification : Version 1.0"); Ex. 1055 (cover page and table of contents of each part in copy at library in Italy); Ex. 1056 (cover page and table of

[5] The record suggests this website (http://www.cselt.stet.it/fipa) was a mirror of the FIPA website (http://drogo.cselt.stet.it/fipa) in 1997. *See* Ex. 1049 ¶ 22; Ex. 1095, 22; Tr. 94:11–14.

[6] The URL provided in the article contains a typographical error. *See* Ex. 1049 ¶ 22 (correcting the URL to http://drogo.cselt.stet.it[/]fipa/).

contents of Part 1 in copy at library in Switzerland). Dr. Finin testifies that the books contain the November 28, 1997, edited version of FIPA 97 Version 1.0, which "only made minor edits (mostly spelling and formatting) over the October 10, 1997 version." Ex. 1049 ¶ 25 (citing Ex. 1055, 5 (Part 2 "publication date" of November 28, 1997); Ex. 1056).

iv. Publications and Patents

In late 1997 and 1998, several papers reviewing and outlining the FIPA 97 specification were published and presented at meetings. *See* Ex. 1049 ¶¶ 26–30. A paper dated December 1997 memorializes a presentation made to a meeting on Intelligent Agent Technology organized by the EPSRC[7] Community Club in Advanced Computing Techniques. Ex. 1097, Cover ("Dickinson");[8] *see* Ex. 1049 ¶ 26. This paper outlines the background and rationale for the creation of an agent interoperability standard. Ex. 1097, 1–3. It also describes the development history of the FIPA 97 specification, noting that FIPA's work program "culminated in the publication of an initial draft standard, FIPA 97, at the Munich meeting on October 1997." *Id.* at 3. Dickinson further provides that "[a]ll FIPA documents and meeting outputs are publicly available on the web" at "http://drogo.cselt.stet.it/fipa/," and "comments and review have been sought at each stage of the process." *Id.* at 3, 7 n.9. The paper then describes the

[7] "The Engineering and Physical Sciences Research Council (EPSRC) is the main funding body for engineering and physical sciences research in the UK." Engineering and Physical Sciences Research Council, epsrc.ukri.org/about (last visited Sept. 28, 2020).
[8] Ian J. Dickinson, *Agent Standards,* HP Laboratories Bristol, HPL-97-156 (Dec. 1997).

features of the specification's three substantive technical sections, Parts 1–3. *Id.* at 3–6.

Similarly, a 1998 paper titled "Industrial Applications of Multi-Agent Technology" summarizes FIPA's background and presents an overview of the three technical parts (i.e., Parts 1–3) of FIPA 97 Version 1.0 released in October 1997. Ex. 1099, 12–13 ("Steiner");[9] *see* Ex. 1049 ¶ 28. The Steiner paper provides the FIPA website address and explains that the four application parts (i.e., Parts 4–7) will be used in field trials to gather information to be incorporated into a revised version of FIPA 97. Ex. 1099, 13 & n.1.

Likewise, a paper titled "FIPA — towards a standard for software agents" appearing in the July 1998 issue of the BT Technology Journal explains the motivation for an agent standard and provides an overview of FIPA's background and activities. Ex. 1100, 51–52 ("O'Brien");[10] *see* Ex. 1049 ¶ 29. It then describes the different parts of the FIPA 97 Version 1.0 specification issued in October 1997. Ex. 1100, 51–52.[11]

Dr. Finin cites several other publications that reference FIPA's development of an agent communication standard in the 1997–98 timeframe.

---

[9] Donald Steiner, Siemens AG, Industrial Applications of Multi-Agent Technology (IEEE 1998).
[10] P.D. O'Brien & R.C. Nicol, *FIPA — towards a standard for software agents*, BT Tech. J. Vol. 16, No. 3 (July 1998).
[11] Dr. Finin testifies that O'Brien provides public links to FIPA97. Ex. 1049 ¶ 29. The copy of O'Brien entered into the record, however, appears to be missing several pages, including one containing endnotes 10–12 that might provide links to the FIPA website. *See* Ex. 1100, 52 ("FIPA97 (issued in October 1997) [10–12] is the first output from FIPA covering part of the requirements for an agent standard.").

Ex. 1049 ¶ 31 (citing Exs. 1027–29). Dr. Finin also identifies several patent applications in the same timeframe that refer to FIPA's agent communication language. *Id.* ¶ 32 (citing Exs. 1030–33).

v. FIPA97 Website

Sometime in 1998, the FIPA website migrated from its original site (http://drogo.cselt.stet.it/fipa) to fipa.org. Ex. 1049 ¶ 23; *see also* Ex. 1026 (Resolution of Munich meeting indicating FIPA's plans for the "redesign of a new FIPA home page"); Ex. 1065, 4 (Resolutions of the Durham meeting in October 1998 indicating the website will be transferred to www.fipa.org). The fipa.org website still exists today even though FIPA is no longer active as a standalone organization. *See* Ex. 1049 ¶¶ 23, 48–49. The current FIPA website maintains a repository of past FIPA documents, including meeting notes, press releases, FIPA resolutions, and different versions of the FIPA specification. *Id.* ¶ 49.

Dr. Finin testifies that the "initial" version of FIPA 97 Version 1.0 (i.e., the specification posted on the FIPA website on October 10, 1997) "remained publicly accessible during all of FIPA's future activities and is still available on FIPA's home page today." *Id.* ¶ 21. According to Dr. Finin, Exhibits 1006–1012 (collectively referred to as FIPA97) are Parts 1–7 of FIPA 97 Version 1.0 as found on the current fipa.org website. *Id.* Based on his personal knowledge, Dr. Finin further testifies that Exhibits 1006–1012 are the "same version" and contain "the same disclosures, content and information" as Parts 1–7 of FIPA 97 Version 1.0 that were publicly available on the FIPA website (http://drogo.cselt.stet.it/fipa) on October 10, 1997, and which Dr. Finin himself accessed in late 1997. *Id.* ¶¶ 21, 34. He also notes that although Exhibit 1006 has a typographical error relating to the version number in the

header of its odd pages,[12] Exhibit 1006 is identical to the version of Part 1 of FIPA 97 Version 1.0 that was released on October 10, 1007. *Id.* ¶ 21. Additionally, as evidence that FIPA 97 Version 1.0 has been continuously available on fipa.org since the website migration, Dr. Finin cites a set of Internet Archive records beginning in 2000 showing where each part of that version of the specification could be accessed. *Id.* (citing Ex. 1054).

Dr. Finin testifies that the original FIPA website, http://drogo.cselt.stet.it/fipa, remained live for several years after the website transitioned to fipa.org. Ex. 1049 ¶ 23. The Internet Archive Wayback Machine contains an archived screen capture of the website http://drogo.cselt.stet.it/fipa from December 1, 1998. *See* Ex. 1051; Ex. 1049 ¶¶ 23, 54. According to Dr. Finin, the archived page shows that the FIPA 97 specification was live and freely available on the FIPA website home page at that time. Ex. 1049 ¶ 23; Ex. 1051, 1 ("FIPA has already developed a seven-part specification called FIPA 97. Implementations of FIPA 97 are undergoing field trials that will last until October 1998 when version 2 of FIPA 97 will be produced."); Ex. 1049 ¶ 23. The home page provided links (i.e., "FIPA 97") to actual specification documents, but those links have not been maintained in the archive. Ex. 1049 ¶ 23. Dr. Finin testifies that the screen capture from the Internet Archive is consistent with the mirror of the former FIPA site hosted by Leonardo Chiariglione. *Id.* ¶ 51 (citing Ex. 1103 (http://leonardo.chiariglione.or/standards/fipa/)). Dr. Chiariglione's mirror is still available, and documents hosted on the

[12] The header on odd pages reads "FIPA 1997 Part 1: Version 2.4." *E.g.*, Ex. 1006, 3.

mirror are "accurate and complete copies of FIPA documents that were available to FIPA members." *Id.*

vi. Analysis

Petitioner argues that FIPA97 was a publicly accessible printed publication as of October 10, 1997, when it was posted on the FIPA website. Pet. 23; Pet. Reply 15–21. More specifically, Petitioner argues that (1) FIPA 97 Version 1.0 was publicly accessible on October 10, 1997, and (2) the version of the FIPA specification found in Exhibits 1006–1012, referred to herein as FIPA97, is the same specification that was posted on the FIPA website on October 10, 1997, and named FIPA 97 Version 1.0. *See*, *e.g.*, Pet. 23 (arguing FIPA 97 Version 1.0 was publicly accessible in late 1997); Pet. Reply 15–17 (arguing that Exhibits 1006–1012 are the same documents that were made public as FIPA 97 Version 1.0). Patent Owner addresses the first contention when it argues the evidence does not show any version of FIPA 97 Version 1.0 was available on the FIPA website. *See, e.g.*, Resp. 69. It also challenges the second contention when it argues Petitioner has failed to show that Exhibits 1006–1012 are identical to the version of the FIPA specification that allegedly was publicly accessible before the critical date. *See*, *e.g.*, *id.* at 62–63. In our analysis below, we address the two questions in turn.

Considering all the facts and circumstances surrounding the development of FIPA 97 Version 1.0 and its publication on the FIPA website, we find that FIPA 97 Version 1.0 was disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the art, exercising reasonable diligence, could locate it. *See Jazz Pharm.*, 895 F.3d at 1355–56. First, the uncontested evidence shows that members of the relevant public (i.e., persons of ordinary skill in the field of software

agent-based technology) knew of the release of FIPA 97 Version 1.0 in late 1997, prior to the critical date. As detailed above, FIPA was open to corporations and educational and governmental organizations without restriction. Ex. 1006, iv. FIPA's members included many industry leaders whose employees attended FIPA meetings, including the October 1997 meeting in Munich where FIPA 97 Version 1.0 was approved for publication. *See id.*; Ex. 1095, 22. FIPA meetings and activities were publicized among the larger community of software agent researchers via the AgentWeb website and its associated Software Agents mailing list and AgentWeb newsletter, which had more than 1,300 subscribers. Ex. 1090, 5; Ex. 1088, 1; Ex. 1087, 1; Ex. 1091, 1–2; Ex. 1092, 3; Ex. 1093, 2; Ex. 1094, 1–2; Ex. 1086, 1–2; *see* Ex. 1049 ¶¶ 8, 10, 12, 14, 17, 19. The newsletter in particular informed subscribers of the development of the FIPA specification during 1996 and 1997 and provided detailed information regarding the release of FIPA 97 Version 1.0 in a November issue. Ex. 1086, 1–2. News articles in periodicals published in late 1997 also announced that FIPA had released and published FIPA 97 Version 1.0. Ex. 1095, 22; Ex. 1096, 93; *see* Ex. 1049 ¶ 22. In addition, the record contains several papers published in late 1997 and 1998, prior to the critical date, describing FIPA 97 Version 1.0 and its release in October 1997. *See* Ex. 1097, 1–7; Ex. 1099, 12–13; Ex. 1100, 51–52; Ex. 1049 ¶¶ 26–30; *see also* Ex. 1049 ¶¶ 31–32 (citing Exs. 1027–33 (other publications and patents referring to FIPA specification)).

The evidence of record also demonstrates that members of the relevant public, exercising reasonable diligence, could have located FIPA 97 Version 1.0 in late 1997 on the FIPA website, housed at the time at

http://drogo.cselt.stet.it/fipa. FIPA published FIPA 97 Version 1.0 on its website at the conclusion of the Munich meeting on October 10, 1997, or shortly thereafter. *See* Ex. 1049 ¶ 20. In the several months leading up to the Munich meeting, persons of ordinary skill in the art would have known about the FIPA website through the widely distributed AgentWeb newsletters and the Software Agents mailing list, which provided website information or direct links to drafts of the specification and meeting announcements and reports. *See* Ex. 1091, 1–2; Ex. 1092, 3; Ex. 1093, 2; Ex. 1094; Ex. 1082, 1; Ex. 1083, 1. Therefore, people working in the field would have been sufficiently familiar with FIPA's activities and its website to look for FIPA 97 Version 1.0 on the FIPA website when it was posted after the Munich meeting. Indeed, both Dr. Finin, who was affiliated with FIPA, and Dr. Lieberman, who worked in the software agent field, testify that they accessed FIPA 97 Version 1.0 on the FIPA website in late 1997. *Id.* ¶ 21; Ex. 1050 ¶ 146.

Moreover, the AgentWeb newsletter dated November 18, 1997, provided a link to the FIPA website and individual links to the seven parts of FIPA 97 Version 1.0 published on the website. Ex. 1086, 1–2; *see* Ex. 1049 ¶ 21. Thus, that issue of the newsletter provided more than 1,300 interested members of the public with direct access to FIPA 97 Version 1.0 at least as of November 18, 1997.

News articles and papers published in late 1997 also provided readers with the website address where FIPA 97 Version 1.0 could be found. *See* Ex. 1095, 22; Ex. 1096, 93; Ex. 1097, 7 n.9. The news articles in particular likely reached a very wide audience because they appeared in publications directed to subject matter broader than agent-based technology. *See*

Ex. 1095 (EETimes); Ex. 1096 (IEEE Internet Computing). The EETimes article was dated October 20, 1997, suggesting that FIPA 97 Version 1.0 was available on the FIPA website at least as of that date.

The undisputed evidence also demonstrates that FIPA 97 Version 1.0 was freely available on the FIPA website without a password or any other restrictions and access was not subject to any requirement or expectation of secrecy or confidentiality. *See* Ex. 1049 ¶ 21; Ex. 1095, 22; *see also* Ex. 1006, iv (stating FIPA intended to make its results available to all interested parties). This evidence further supports our finding that FIPA 97 Version 1.0 was publicly accessible in late 1997. *See Jazz Pharm.*, 895 F.3d at 1358–59; *Voter Verified, Inc. v. Premier Election Solutions, Inc.*, 698 F.3d 1374, 1380–81 (Fed. Cir. 2012); *MIT v. AB Fortia*, 774 F.2d 1104, 1109 (Fed. Cir. 1985).

Patent Owner's arguments, many of which attack pieces of evidence individually, do not persuade us that Petitioner has failed to show that FIPA 97 Version 1.0 was publicly accessible. First, Patent Owner argues that no evidence shows the original FIPA website (http://drogo.cselt.stet.it/fipa) existed prior to a December 1, 1998, Internet Archive capture. Resp. 68 (citing Ex. 1051). To the contrary, much of the documentary evidence from late 1997 and testimonial evidence identifies that website or its mirror as the FIPA website during the relevant time period. *See* Ex. 1049 ¶ ¶ 20–23; Ex. 1092, 3; Ex. 1093, 2; Ex. 1095, 22; Ex. 1096, 93; Ex. 1097, 7 n.9. Notwithstanding the absence of an Internet Archive capture for the website from a date prior to December 1998, we find that, based on the totality of evidence in the record, the original FIPA website existed in late 1997.

Patent Owner also argues that none of the documents cited by Petitioner provide active links to FIPA 97 Version 1.0 and therefore are insufficient proof of public accessibility. Resp. 69; Sur-reply 30. Again, based on the totality of evidence in the record, including but not limited to the testimony of Dr. Finin that he accessed FIPA 97 Version 1.0 on the FIPA website in late 1997, we find that FIPA 97 Version 1.0 was available on the FIPA website at that time, notwithstanding the lack of active links today, more than twenty years later. Patent Owner finds fault with Dr. Finin's testimony on this point because he does not claim to have used any of the links in the AgentWeb newsletters to access FIPA 97 Version 1.0. Sur-reply 30 (citing Ex. 1049 ¶ 21). Patent Owner, however, overlooks Dr. Finin's testimony that he was the founder and author of the AgentWeb newsletter, implying that he created the links in the newsletter. *See* Ex. 1049 ¶ 8. Therefore, based on Dr. Finin's personal knowledge regarding the links in the AgentWeb newsletter dated November 18, 1997, and the other evidence corroborating his testimony, we find that FIPA 97 Version 1.0 was available on the FIPA website in late 1997.

Patent Owner further asserts that, to the extent the Internet Archive capture from December 1998 provides an operable download link, it links to Version 2.0 of the FIPA 97 specification. Resp. 69 (citing Ex. 1051). It is not surprising, however, that FIPA's website in December 1998 provided links to FIPA 97 Version 2.0, which FIPA released in October 1998 to provide minor updates to two parts of the specification. *See* Ex. 1049 ¶ 35; Ex. 1053, vi. In any event, the December 1998 Internet Archive capture at least shows that the FIPA website was live at that time, which was prior to the critical date. *See* Ex. 1049 ¶ 23 (citing Ex. 1051, 1).

In its Sur-reply, Patent Owner argues for the first time that Petitioner has not demonstrated that a person of ordinary skill in the art in 1997 could have found FIPA 97 Version 1.0 using search tools or that the FIPA website was indexed so the specification could be located. Sur-reply 27–28. Further, Patent Owner argues that the existence of different FIPA websites at various times would have made it even more difficult to find the correct version of the FIPA specification without sufficient indexing or search tools. *Id.* at 29.

Even if we consider this late argument, we find it unpersuasive. As detailed above, the uncontested evidence shows that the address of the FIPA website itself was widely known among those skilled in the art and that FIPA routinely provided links to the FIPA specification on the website's home page. *See* Ex. 1095, 22; Ex. 1096, 93; Ex. 1097, 7 n.9; Ex. 1051, 1; Ex. 1021, 1; Ex. 1025, 1. The November 1997 AgentWeb newsletter also provided direct links to FIPA 97 Version 1.0. Ex. 1086, 1–2. Under these circumstances, we find that a member of the interested public could have found FIPA 97 Version 1.0 without search tools or indexing by using the links in the AgentWeb newsletter or navigating to the well-known FIPA website home page. We also find that the record, including Dr. Finin's testimony, satisfactorily explains the various FIPA websites and website addresses over time and clearly identifies the FIPA website that was being used in late 1997. *See* Ex. 1049 ¶¶ 22–23, 48–49, 51.

Having determined that FIPA 97 Version 1.0 was publicly accessible on the FIPA website in late 1997, as early as October 10 and no later than November 18, we turn to whether Exhibits 1006–1012 (collectively referred to as FIPA97) contain the same version of the FIPA specification that was

available on the FIPA website during that timeframe. Dr. Finin testifies that Exhibits 1006–1012, documents available on the current FIPA website (fipa.org) and identified as FIPA 97 Version 1.0, are the same version with the same content as Parts 1–7 of FIPA 97 Version 1.0 that were released at the FIPA Munich meeting on October 10, 1997, and were publicly available on the FIPA website (http://drogo.cselt.stet.it/fipa) in late 1997. Ex. 1049 ¶¶ 21, 34.

As an initial matter, the October 10, 1997, date on the cover pages of several parts of FIPA97 supports Dr. Finin's testimony that FIPA97 is the same as FIPA 97 Version 1.0 as published on the FIPA website in late 1997. *See* Ex. 1006, Cover; Ex. 1007, Cover; Ex. 1008, Cover; Ex. 1010, Cover; Ex. 1012, Cover; *see also* Ex. 1009, Cover (Part 4 identifying a 1997 copyright date); Ex. 1011, Cover (Part 6 identifying a 1997 copyright date). Patent Owner contends that Petitioner cannot rely on the date stamps or copyright notices on Exhibits 1006–1012 to establish public accessibility because they are hearsay. Resp. 61; Sur-reply 22–24. We agree with Petitioner that Patent Owner has waived this argument because it did not raise an objection on evidentiary grounds pursuant to 37 C.F.R. § 42.64(b)(1). *See* Pet. Reply 15–16. Furthermore, we agree with Petitioner that the dates on the cover pages are not hearsay because they are evidence tending to show that FIPA97 is identical to FIPA 97 Version 1.0, not statements offered to show Exhibits 1006–1012 were published on a certain date. *See id.* at 16 (citing *Apple Inc. v. VirnetX Inc.*, IPR2016-01585, Paper 32 at 58 (PTAB Feb. 20, 2018)).

Patent Owner also argues that Petitioner cannot rely on the cover page dates alone as proof of the documents' public accessibility. Sur-reply 23.

The date stamps, however, are only part of the totality of evidence offered by Petitioner to establish public accessibility. As such, they are relevant evidence supporting a finding that FIPA97 was publicly accessible. *See Hulu*, Paper 29 at 17–18 (citing *Nobel Biocare*, 903 F.3d at 1377).

Patent Owner argues that the existence of multiple versions of FIPA 97 Version 1.0 undercuts Petitioner's position and Dr. Finin's testimony that Exhibits 1006–1012 are the version of FIPA 97 Version 1.0 that was publicly accessible in late 1997. *See* Resp. 62–65; Sur-reply 25. For example, Patent Owner points to Dr. Finin's description of the version released on October 10, 1997, as an "initial" version, after which final minor edits were to be made. Resp. 63–64 (citing Ex. 2068, 86:11–15, 88:9–89:25); *see* Ex. 1049 ¶ 21. Patent Owner cites an Internet Archive capture in the record referring to "FIPA 97 specification ver. 1.0 (Reston meeting)." Resp. 64–65 (citing Ex. 1105, 27). Patent Owner also cites evidence, including Dr. Finin's testimony, that a different version of FIPA 97 Version 1.0 was published in hardcopy books. *Id.* at 65 (citing Exs. 1055, 1056; Ex. 1049 ¶ 25 (stating that "FIPA printed the November 28, 1997, edited version of the specification" in the books)).

Patent Owner argues that because these various versions of FIPA 97 Version 1.0 have not been substantively introduced into evidence so that the differences can be ascertained, Petitioner has not shown that Exhibits 1006–1012 are the version that was publicly accessible on the FIPA website in late 1997. *See* Resp. 66–67. We disagree. Dr. Finin testifies that Exhibits 1006–1012 are the same documents that were released at the conclusion of the FIPA meeting in Munich on October 10, 1997, and were made publicly available at the time. Ex. 1049 ¶¶ 21, 34. Other evidence of

record corroborates Dr. Finin's testimony and adequately explains the multiple versions of the specification. *See* Pet. Reply 17–18. As set forth in detail above, FIPA released a version of FIPA 97 Version 1.0 on October 10, 1997, and made it available on the FIPA website soon thereafter. *See* Ex. 1049 ¶ 21; Ex. 1086, 1–2; Ex. 1095, 22; Ex. 1096, 93. It is clear from the record that any earlier versions of the specification, such as the version made available after the Reston meeting six months before FIPA 97 Version 1.0, were drafts made available for public comment. *See* Pet. Reply 17; Ex. 1049 ¶¶ 16–18; Ex. 1024; Ex. 1061.

The record also shows that the version published in book form is a later version, dated November 28, 1997, containing minor formatting and clerical edits. *See* Ex. 1049 ¶ 25; Ex. 1055, 5. Petitioner does not rely on the book version as a prior art reference or assert that it was publicly accessible. *See* Pet. 23–24; Pet. Reply 17–18. The hardcopy book excerpts in the record merely corroborate Dr. Finin's testimony that FIPA's activities and release of the FIPA specification were known in the art. *See* Ex. 1049 ¶ 24.

Patent Owner also points to the erroneous header on odd pages in Exhibit 1006 as calling into question which version of the specification is in Exhibits 1006–1012. Resp. 66. We credit Dr. Finin's unrebutted testimony that the header on some pages in Exhibit 1006 is a typographical error. *See* Ex. 1049 ¶ 21. Patent Owner has not cited, nor do we see, evidence in the record suggesting a FIPA 97 Version 2.4 was made publicly available. *See* Resp. 66.

Patent Owner finds fault with Exhibits 1006–1012 because they were obtained after the critical date and could not have been obtained from a

website prior to the critical date. *See* Resp. 61–62; Sur-reply 21. In his declaration, Dr. Finin testifies that Exhibits 1006–1012 are available on the FIPA website today (i.e., fipa.org), and the earliest Internet Archive record of the relevant website pages shows the documents were posted in 2000. Ex. 1049 ¶ 21 (citing Ex. 1054). Patent Owner contends that in his deposition Dr. Finin acknowledged that Exhibits 1006–1012 could have been obtained from files saved in the Internet Archive between 2003 and 2004. Resp. 61–62 (citing Ex. 2068, 93:12–94:2, 96:7–20). In either case, Patent Owner argues, the dates are after the critical date of the '560 patent. *Id.* at 62; Sur-reply 21. We agree with Petitioner, however, that the date Exhibits 1006–1012 were obtained is immaterial if they are digital copies of documents that are shown to have been publicly accessible before the critical date. *See* Pet. Reply 16 (citing *In re Wyer*, 655 F.2d at 226–27).

Finally, Patent Owner argues that the testimony of Dr. Finin and Dr. Lieberman is conclusory, unreliable, and uncorroborated and therefore insufficient to establish public accessibility. Resp. 71–74; Sur-reply 20–22. "[C]orroboration is required of any witness whose testimony alone is asserted to invalidate a patent, regardless of his or her level of interest." *Nobel Biocare*, 903 F.3d at 1377–78 (quoting *Finnigan Corp. v. ITC*, 180 F.3d 1354, 1369 (Fed. Cir. 1999)). This corroboration requirement applies when relying on witness testimony to establish public accessibility of a prior art reference. *See id.* at 1377–81; *Typeright Keyboard Corp. v. Microsoft Corp.*, 374 F.3d 1151, 1158–60 (Fed. Cir. 2004). Corroborating evidence may include documentary or testimonial evidence, and circumstantial evidence may provide sufficient corroboration. *Nobel Biocare*, 903 F.3d at 1378. Determining whether testimony has been corroborated "involves an

assessment of the totality of the circumstances including an evaluation of all pertinent evidence." *Id.*

We are not persuaded by Patent Owner's argument regarding the testimony of Dr. Finin and Dr. Lieberman. Dr. Finin's testimony is based on his personal knowledge as someone who was directly involved in FIPA's activities by submitting comments on draft specifications and attending meetings, for example, and providing independent advice as a FIPA Fellow. His testimony that FIPA approved FIPA 97 Version 1.0 at the Munich meeting on October 10, 1997, and posted it to the FIPA website so that it was publicly accessible is corroborated by the evidence in the record of the facts and circumstances surrounding the development and release of the specification as analyzed above. Dr. Lieberman's testimony that as a member of the interested public he accessed FIPA 97 Version 1.0 in late 1997 is corroborated by the same evidence.

As for Dr. Finin's testimony, based on his personal knowledge, that Exhibits 1006–1012 are the same as the version of FIPA 97 Version 1.0 that was publicly accessible on the FIPA website in late 1997, we find it to be credible and corroborated by other evidence of record. We are not persuaded that Dr. Finin's inability to recall many of the details of a 300-page specification more than twenty years after it was created undermines his testimony. *See* Resp. 72–73. Furthermore, we find that the evidence discussed above, including the identification of Exhibits 1006–1012 on their cover pages or elsewhere as FIPA 97 Version 1.0 with a date of October 10, 1997, corroborates Dr. Finin's testimony that the version of the specification in Exhibits 1006–1012 is the version that was publicly

accessible on the FIPA website in late 1997, and not some other version of the FIPA specification.

For these reasons, we find that a preponderance of the evidence shows that Exhibits 1006–1012 are the version of FIPA 97 Version 1.0 released on October 10, 1997, and posted on the FIPA website in late 1997. As discussed above, a preponderance of the evidence shows that the October 10, 1997 version of FIPA 97 Version 1.0 was publicly accessible in late 1997. Accordingly, we find that Petitioner has met is burden to show that FIPA97, submitted as Exhibits 1006–1012 and relied on by Petitioner in its unpatentability challenges, was publicly accessible prior to the critical date of January 5, 1999, and therefore is available as prior art to the '560 patent under 35 U.S.C. § 102(a).

4. Obviousness over Kiss and FIPA97

Petitioner asserts claims 1–3, 11, and 48–60 are unpatentable as obvious under 35 U.S.C. § 103 over the combination of Kiss and FIPA97. Pet. 32–67. Petitioner argues, "FIPA97 provides a common communications protocol and language (FIPA ACL) between the agents of Kiss, and also adds its administrative functionality and exemplary practices to the Kiss system." Pet. 28. Petitioner explains, "[t]hese techniques are used to implement the functionality described in Kiss, including facilitating agent collaboration, agent registry, and inter-agent messaging." *Id.* (citing Ex. 1005, 3:32–36, 3:67–4:1, 6:67–7:1). Petitioner asserts, "[w]here the two systems disclose analogous functionality, such as facilitating cooperation and agent registry, their techniques are combined, as a Skilled Artisan would understand that to be an efficient and common sense way to implement the

combined system in order to obtain the benefits of both, and therefore be motivated to do so." *Id.* (citing Ex. 1003 ¶¶ 217–219).

5. Motivation to Combine Kiss and FIPA97

Petitioner argues the proposed combination of Kiss and FIPA97 would have been obvious for several reasons. Petitioner argues Kiss, FIPA97, and the '115 Patent are analogous art, because "each is directed to the same field of endeavor, *i.e.*, distributed computing environments generally and architectures for communication and cooperation among distributed electronic agents specifically." Pet. 28 (citing *e.g.*, Ex. 1001, 1:25–29; Ex. 1005, Abstract; Ex. 1007, Foreword, 1; Ex. 1003 ¶ 220). Petitioner also argues, "FIPA97 and Kiss are reasonably pertinent to the problem addressed by the '115 Patent—*e.g.*, the need for 'flexible, fault-tolerant, distributed problem solving' using 'agent-based technologies.'" Pet. 28 (citing Ex. 1001, 4:34–40; Ex. 1005, 2:33–40; Ex. 1007, 1; Ex. 1003 ¶ 221).

Petitioner argues,

> [i]t would have been obvious to make this combination because to do so would have been the arrangement of old elements (*i.e.*, the functionality of FIPA97, and the system of Kiss) with each performing the same function it had been known to perform (communication between distributed agents (FIPA97v1)); cooperative task competition and problem solving (Kiss)) and yielding no more than what one would expect from such an arrangement (a system of distributed agents, able to communicate to conduct cooperative task completion and problem solving).

Pet. 29 (citing Ex. 1020, 2; Ex. 1046, 50; Ex. 1003 ¶ 222).

Petitioner also argues it

> would have been obvious because a Skilled Artisan would have known that agents, such as in Kiss, must use a common

> communications protocol, i.e., an inter-agent communication language, and related management functionality, and therefore would have been motivated to consider and employ one of the available inter-agent communications languages and its related functionality, and because doing so would have been a convenient and efficient way to facilitate effective communication between agents.

Pet. 29 (citing Ex. 1003 ¶ 223; Ex. 1020, 2; Ex. 1046, 50).

Petitioner further argues,

> a Skilled Artisan would also have been motivated based on earlier descriptions of KQML's similar use of an inter-agent communication language, their disclosure that '[t]here are several levels at which agent-based systems must agree, at least in their interfaces, in order to successfully interoperate: Transport … Language … Policy … Architecture,' and their disclosure of the necessity of a robust inter-agent communication language in a system like Kiss.

Pet. 29–30 (citing Ex. 1016, Abstract, 4, 29, 30; Ex. 1006, 7; Ex. 1007, 40–42; Ex. 1005, Abstract; Ex. 1003 ¶¶ 224–226).

Petitioner argues it "would also have been obvious to try this combination because the necessity of a common inter-agent communication language was a known design need in a system such as Kiss, and there were only a small number of identified, predictable solutions to that need, such as FIPA ACL." Pet. 30 (citing Ex. 1020, 2; Ex. 1046, 50; Ex. 1035, 1; Ex. 1003 ¶ 227).

Petitioner also argues,

> [a] Skilled Artisan would have been further motivated to make the combination because of the known advantages of FIPA97, including that it specifies, 'key agents necessary for the management of an agent system, the ontology necessary for the interaction between systems, and it defines also the transport level of the protocols.'

Id. at 30 (citing Ex. 1035, 1; Ex. 1003 ¶ 229).

Further, Petitioner argues:

> a Skilled Artisan would have been motivated to make the combination because FIPA97 represented a substantial attempt to formulate an industry standard designed to encourage interoperability and uniformity amongst agent systems. A Skilled Artisan would have understood that agent systems that complied with such a standard would be more likely to be interoperable with other systems and would likely have more resources available.

Id. at 30–31 (citing Ex. 1007, vii; Ex. 1047; Ex. 1003 ¶ 230).

Petitioner argues, "[a] Skilled Artisan would have been further motivated to include the administrative functionality and exemplary practices described in FIPA97 with Kiss because the description of such functionality and practices in FIPA97 suggests that their use with the FIPA ACL would be advantageous and workable." Pet. 31. Petitioner also argues, "[a] Skilled Artisan would also have been motivated to employ such additional functionality and practices in the combined system in order to obtain the full benefit of using FIPA ACL." *Id.* (citing Ex. 1003 ¶ 231).

Finally, Petitioner argues, "a Skilled Artisan could have made the combination cited above without undue experimentation including because by January 1999 the components parts of this combination were well-known, conventional technology and because others had combined FIPA97v1 technology with agent systems." Pet. 31–32 (citing Ex. 1007; Ex. 1016; Ex. 1030; Ex. 1003 ¶ 228).

Patent Owner asserts that "Petitioner utterly defaults in offering any reason to combine *Kiss* and *FIPA97*." Resp. 116. Patent Owner argues that Petitioner's motivation to combine Kiss and FIPA97 suffers from "hindsight bias" and that Petitioner "offers no reason or explanation that a person of skill in the art looking at *Kiss* would be motivated to find a particular

language with the characteristics of *FIPA97's* ACL." *Id.* Patent Owner also argues that Petitioner does not "explain what 'efficiencies' a person of ordinary skill in the art would be looking for" and "fails to identify how the combination could be achieved." *Id.* at 116–117.

Patent Owner argues that "[e]ven if the combination of the *Kiss* meta-agent and the *FIPA97* Directory Facilitator had disclosed the claimed facilitator agent (it did not), Petitioner fails to offer any reason that a person of ordinary skill in the art would have been motivated to do so." *Id.* at 79. Patent Owner argues, "Petitioner offers no reason that the meta-agent of *Kiss* would need any capability offered by *FIPA97*." *Id.* "Indeed," Patent Owner argues, "*Kiss* itself already includes a registry." *Id.*

Patent Owner also argues that the "Petition says nothing" about how to combine FIPA97's Directory Facilitator and Kiss' meta-agent. *Id.* at 80. Patent Owner argues the "two architectures look quite different," and that "Petitioner offers no articulation of how to add [FIPA Directory Facilitators] to any of the *Kiss* layers." *Id.* at 81.

Patent Owner argues:

> If *Kiss's* meta agents were replaced by or combined with *FIPA's* [Directory Facilitators] in some way, like the Petition suggests, the directory service provided by the [Directory Facilitators] would clash with the duplicate and potentially conflicting services provided by the existing agent service layer. Other agents in *Kiss* would either be unable to obtain the registry services or would receive duplicate and/or contradictory answers, resulting in an inoperative device.

Id. at 82 (citations omitted).

Patent Owner also argues that Petitioner's combination of FIPA97, Kiss and Cohen "is emblematic of hindsight bias" because Dr. Lieberman "picks and chooses elements" and "superimposes them into one figure in an

attempt to 'show' the combination." *Id.* at 84. Patent Owner argues that "simply drawing in block diagrams with terminology from other references into one cobbled diagram is insufficient as a matter of law without any explanation of how such a combination could be achieved or, indeed, why." *Id.* at 84–85.

In Reply, Petitioner argues that Patent Owner "ignores the several pages of analysis supported by expert testimony (including citations to evidence in the prior art) articulating the rational underpinning of the combination" of Kiss and FIPA97. Reply 30 (citing Pet. 28–32). Petitioner argues that "while there was no requirement to show that a Skilled Artisan would search for 'a particular language with the characteristics of FIPA97's ACL,'" (Resp. 116), the Petition does explain that "agents, such as in Kiss, must use a common communications protocol," so a Skilled Artisan "would have been motivated to 'employ one of the available inter-agent communications languages . . . because doing so would have been a convenient and efficient way to facilitate effective communication between agents.'" Reply 30–31 (citing Pet. 29–30; Ex. 1003 ¶ 223).

Petitioner also argues that Patent Owner's criticism that "Petitioner fails to identify how the combination could be achieved," (Resp. 117), is "legally irrelevant" (citing *In re Keller*, 642 F.2d 413, 425 (CCPA 1981), and "also ignores the detailed description in the Petition (supported by Dr. Lieberman) that demonstrates how the combination would work." Reply 31 (citing Pet. 28–32; Ex. 1003 ¶¶ 217–219; Ex. 1005, Figs. 4–6, 21 (annotated)). Petitioner points out that:

> [t]he Petition explains, for example, that FIPA97 provides a common communications protocol and language (FIPA ACL) between the agents of Kiss, and also adds its administrative functionality and exemplary practices to the Kiss system, as

> described with specificity below. These techniques are used to implement the functionality described in Kiss, including facilitating agent collaboration, agent registry, and inter-agent messaging, (Ex. 1005, 3:32–36, 3:67-4:1, 6:67–7:1), as well adding functionality that is disclosed in FIPA97.

Reply 34.

In its Sur-reply, Patent Owner argues that Petitioner's evidence of a motivation to combine are simply "[p]ages of boilerplate language" or exhibit "*ex post* reasoning colored by hindsight." Sur-reply 58, 62. Patent Owner argues that the FIPA97 and Kiss protocols are "different" and "mutually exclusive" and that "Petitioner offers no argument or evidence relating to how these completely different components would be reconciled." *Id.* at 59–61. Patent Owner argues that FIPA97 "discouraged interoperability between different and incompatible systems." *Id.* at 61.

Patent Owner also argues that "[t]he Board must disregard" portions of Petitioner's Reply, which discuss "a series of four figures from Dr. Lieberman's declaration," "because it constitutes new argument." *Id.* at 63. Patent Owner argues that "the Petition must contain a 'full statement of the reasons for the relief requested'" and "cannot simply incorporate by reference its expert's declaration." *Id.* (citing 37 C.F.R § 42.6(a)(3)).

In identifying a reason that would have prompted a person of ordinary skill in the relevant field to combine the prior art teachings, the Petitioner "must show some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). A reason to combine teachings from the prior art "may be found in explicit or implicit teachings within the references themselves, from the ordinary knowledge of those skilled in the art, or from the nature of the problem to be solved." *WMS Gaming Inc. v. Int'l Game*

Tech., 184 F.3d 1339, 1355 (Fed. Cir. 1999) (*citing In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998)).

Here, Petitioner explains that:

> FIPA97 provides a common communications protocol and language (FIPA ACL) between the agents of Kiss, and also adds its administrative functionality and exemplary practices to the Kiss system, as described with specificity below. These techniques are used to implement the functionality described in Kiss, including facilitating agent collaboration, agent registry, and inter-agent messaging, Ex. 1005, 3:32–36, 3:67–4:1, 6:67–7:1, as well adding functionality that is disclosed in FIPA97. Where the two systems disclose analogous functionality, such as facilitating cooperation and agent registry, their techniques are combined, as a Skilled Artisan would understand that to be an efficient and common sense way to implement the combined system in order to obtain the benefits of both, and therefore be motivated to do so.

Pet. 27–28 (citing Ex. 1003 ¶¶ 217–219).

Petitioner provides persuasive evidence that Kiss and FIPA97 are analogous art because "each is directed to the same field of endeavor, *i.e.*, distributed computing environments generally and architectures for communication and cooperation among distributed electronic agents specifically." Pet. 28 (citing Ex. 1001, 1:25–29; Ex. 1005, Abstract; Ex. 1007, Foreword, 1; Ex. 1003 ¶ 220). Petitioner also provides persuasive evidence that FIPA97 and Kiss "are reasonably pertinent to the problem addressed by the 115 Patent—*e.g.*, the need for 'flexible, fault-tolerant, distributed problem solving' using 'agent-based technologies.'" Pet. 28 (citing Ex. 1001, 4:34–40; Ex. 1005, 2:33–40; Ex. 1007, 1; Ex. 1003 ¶ 221).

Petitioner argues persuasively that

> [i]t would have been obvious to make this combination because to do so would have been the arrangement of old elements (*i.e.*, the functionality of FIPA97, and the system of Kiss) with each

> performing the same function it had been known to perform (communication between distributed agents (FIPA97v1)); cooperative task competition and problem solving (Kiss)) and yielding no more than what one would expect from such an arrangement (a system of distributed agents, able to communicate to conduct cooperative task completion and problem solving).

Pet. 29 (citing Ex. 1020, 2; Ex. 1046, 50; Ex. 1003 ¶ 222).

Petitioner also argues, and we agree, that it

> would have been obvious because a Skilled Artisan would have known that agents, such as in Kiss, must use a common communications protocol, i.e., an inter-agent communication language, and related management functionality, Ex. 1020, 2; Ex. 1046, 50, and therefore would have been motivated to consider and employ one of the available inter-agent communications languages and its related functionality, and because doing so would have been a convenient and efficient way to facilitate effective communication between agents.

Pet. 29 (citing Ex. 1003 ¶ 223).

Petitioner goes on to argue that "a Skilled Artisan would also have been motivated based on earlier descriptions of KQML's similar use of an inter-agent communication language," (citing Ex. 1016, Abstract) and their disclosure that "[t]here are several levels at which agent-based systems must agree, at least in their interfaces, in order to successfully interoperate: Transport … Language … Policy … Architecture," (citing Ex. 1016, 4, 29, 30) as well as their disclosure of "the necessity of a robust inter-agent communication language in a system like Kiss." Pet. 29–30 (citing Ex. 1006, 7; Ex. 1007, 41, 4–-42; Ex. 1005, Abstract; Ex. 1003 ¶¶ 224–226).

Petitioner further argues that "[s]uch a combination would also have been obvious to try this combination because the necessity of a common inter-agent communication language was a known design need in a system such as Kiss," (citing Ex. 1020, 2; Ex. 1046, 50) and there were only a small

number of identified, predictable solutions to that need, such as FIPA ACL." Pet. 30 (citing Ex. 1035, 1; Ex. 1003 ¶ 227).

Petitioner goes on to argue that a "Skilled Artisan" would also have been motivated to combine FIPA97 and Kiss in the manner described in the Petition "because of the known advantages of FIPA97, including that it specifies, 'key agents necessary for the management of an agent system, the ontology necessary for the interaction between systems, and it defines also the transport level of the protocols'" (citing Ex. 1035, 1; Ex. 1003 ¶ 229), and "because FIPA97 represented a substantial attempt to formulate an industry standard designed to encourage interoperability and uniformity amongst agent systems." Pet. 30 (citing Ex. 1007, vii; Ex. 1047).

Petitioner also explains that:

> [a] Skilled Artisan would have been further motivated to include the administrative functionality and exemplary practices described in FIPA97 with Kiss because the description of such functionality and practices in FIPA97 suggests that their use with the FIPA ACL would be advantageous and workable. A Skilled Artisan would also have been motivated to employ such additional functionality and practices in the combined system in order to obtain the full benefit of using FIPA ACL.

Pet. 31 (citing Ex. 1003 ¶ 231).

In light of the reasons and the explanations Petitioner provides that would have motivated a person of ordinary skill in the art to combine the teachings of FIPA97 and Kiss in the manner Petitioner describes, Patent Owner's argument that "Petitioner utterly defaults in offering *any reason* to combine *Kiss* and *FIPA97*" (*see* Resp. 116) (emphasis added), is directly contrary to the evidence of record and is unpersuasive. So too is Patent Owner's argument that "Petitioner fails to offer *any reason* that a person of ordinary skill in the art would have been motivated" to combine "the *Kiss*

meta-agent and the *FIPA97* Directory Facilitator." *See* Resp. 79 (emphasis added).

Patent Owner also argues that Petitioner "offers no reason or explanation that a person of skill in the art looking at *Kiss* would be motivated to find a particular language with the characteristics of FIPA97's ACL." *Id*. at 116. Patent Owner's argument, however, is misplaced. The test for obviousness is not whether a person of ordinary skill in the art "looking at *Kiss* would be motivated to find a particular language with the characteristics of FIPA97's ACL." Rather, "[u]nder the correct [obviousness] analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 420 (2007).

Here, Petitioner provides persuasive evidence and argument that FIPA97 and Kiss "are reasonably pertinent to the problem addressed by the 115 Patent—*e.g.*, the need for 'flexible, fault-tolerant, distributed problem solving' using 'agent-based technologies.'" Pet. 28 (citing Ex. 1001, 4:34–40; Ex. 1005, 2:33–40; Ex. 1007, 1; Ex. 1003 ¶ 221). This evidence includes the '115 patent's observation that:

> [a]gent-based systems have shown much promise for flexible, fault-tolerant, distributed problem solving. Several agent-based projects have helped to evolve the notion of facilitation. However, existing agent-based technologies and architectures are typically very limited in the extent to which agents can specify complex goals or influence the strategies used by the facilitator.

Ex. 1001, 4:34–40, as well as Kiss' observation that "a need exists for a knowledge management system for dynamic, distributed problem-solving systems. Ex. 1005, 2:39–40. Indeed, Dr. Lieberman notes that the FIPA97

specification "defines a language and supporting tools, such as protocols, to be used by intelligent software agents to communicate with each other," and that "the terms used and the mechanisms used [by FIPA97] support such a higher-level, often *task based*, view of interaction and communication." Ex. 1003 ¶ 221. This evidence support's Petitioner's position that a person of ordinary skill in the art at the time of the claimed invention would have combined FIPA97 and Kiss in the manner described in the Petition to provide a flexible, fault-tolerant, distributed problem solving system using agent-based technologies.

Patent Owner further argues that "Petitioner offers no reason that the meta-agent of *Kiss* would need any capability offered by *FIPA97*." Resp. 79. Patent Owner argues that the "Petition says nothing" about how to combine FIPA97's Directory Facilitator and Kiss' meta-agent. *Id.* at 80. Patent Owner makes the observation that the "two architectures look quite different," and that "Petitioner offers no articulation of how to add [FIPA Directory Facilitators] to any of the *Kiss* layers." *Id.* at 81. Patent Owner argues:

> If *Kiss's* meta agents were replaced by or combined with *FIPA's* [Directory Facilitators] in some way, like the Petition suggests, the directory service provided by the [Directory Facilitators] would clash with the duplicate and potentially conflicting services provided by the existing agent service layer. Other agents in *Kiss* would either be unable to obtain the registry services or would receive duplicate and/or contradictory answers, resulting in an inoperative device.

Id. at 82 (citations omitted).

We note that, "the [obviousness] 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 (2007). The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what *the combined teachings* of the references *would have suggested* to those of ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

Here, contrary to Patent Owner's arguments, Petitioner provides a description in the Petition (supported by Dr. Lieberman's Declaration) that explains how a person of ordinary skill in the art would combine FIPA97 and Kiss. *See, e.g.,* Pet. 28–32; Ex. 1003 ¶¶ 217–219. For example, the Petition explains that "FIPA97 provides a common communications protocol and language (FIPA ACL) between the agents of Kiss, and also adds its administrative functionality and exemplary practices to the Kiss system." Pet. 27–28. The Petition also explains that "[t]hese techniques are used to implement the functionality described in Kiss, including *facilitating agent collaboration,* agent registry, and inter-agent messaging . . . as well adding functionality that is disclosed in FIPA97." *Id.* at 28 (citing Ex. 1005, 3:32–36, 3:67–4:1, 6:67–7:1) (*italicized* emphasis added).

Petitioner's proffered combination of FIPA97 and Kiss is amply supported by Dr. Lieberman's testimony. For example, Dr. Lieberman explains that:

> in the combination of Kiss with FIPA97, the "interagent abstract communications facilities" of Kiss, EX1005, 3:32-36, would use the inter-agent communication language of FIPA97 to, for example, "negotiate with each other, conduct joint planning, and to collaborate in the execution of planned tasks," EX1005, 3:32-36. Additionally, *the Agent Service Layer and meta-agent of Kiss would be implemented using* the FIPA97 Agent Management

> System ("FIPA AMS") and *the functionality of the FIPA Directory Facilitator*, described in EX1006. Thus, *the "capabilities, interests, and attributes for the knowledge modules*" EX1005, 6:67-7:1, as stored in the agent registry of Kiss, and the meta agent of Kiss, *would be implemented with the directory facilitator functionality of FIPA97*. Therefore, FIPA AMS would be used to provide a "scalable and modular," EX1005, 3:67-4:1, inter-agent management system and agent registry for the distributed agents of Kiss. Further, the combination of FIPA97 and Kiss would be informed by and include the exemplary practices described in the informative sections of FIPA97 (i.e, Parts 4-7). The following are further annotated figures from Kiss representing exemplary depictions of the combined Kiss/FIPA97 system.

Ex. 1003 ¶ 219 (citing Ex. 1005, Figs. 4–5, 6, 21) (*italicized* emphasis added).

Dr. Lieberman provides an annotated version of Kiss' Figure 21, shown below, illustrating how FIPA97's Directory Facilitator (DF) and Facilitating Agent (FA) would be incorporated into Kiss' Knowledge Management System.

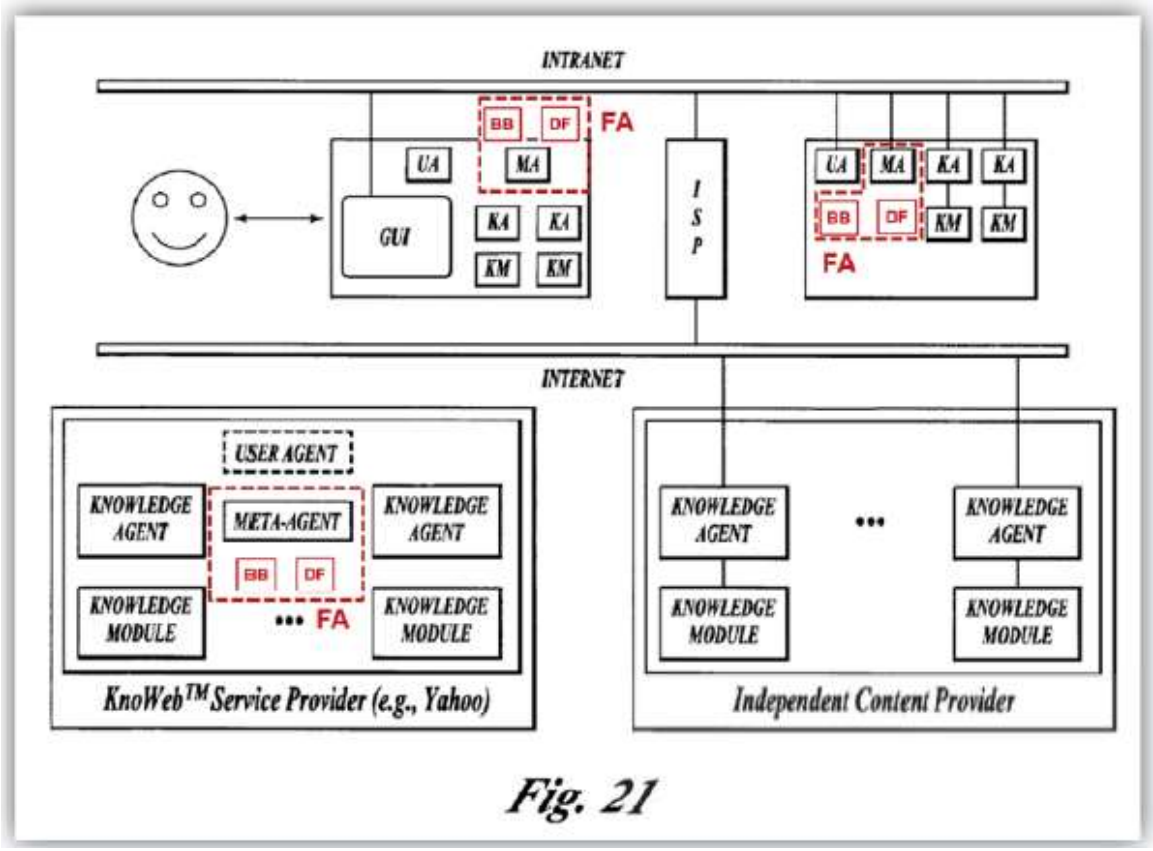


Fig. 21

Petitioner's annotated version of Kiss' Figure 21, shown above, depicts how FIPA97's Directory Facilitator (DF) and Facilitating Agent (FA) would be incorporated into the User Interface Layer, Meta-Agent Layer, and Knowledge Agent Layer of Kiss' Knowledge Management System connected to a distributed environment such as the Internet. *See* Ex. 1003, ¶¶ 217–219, pgs. 132–135; Ex. 1005, 10:55–12:28, 14:31–36, Figs. 4–6, 8, 21. Patent Owner's arguments that the Petition "says nothing" about how to combine FIPA97's Directory Facilitator and Kiss' meta-agent and offers "no articulation" of how to add a Directory Facilitator to any of the Kiss layers is simply contrary to the evidence of record. Similarly, Patent Owner's arguments that the FIPA97 and Kiss protocols are "mutually exclusive" and that FIPA97 "discouraged interoperability" between systems

is not adequately supported by the record and is unpersuasive. *See* Sur-reply 59–61.

Patent Owner's argument in its Sur-reply that we must "disregard" portions of Petitioner's Reply discussing Dr. Lieberman's annotated illustrations because it constitutes "new argument" is also unpersuasive. *See* Sur-reply 63. The identified portions of Petitioner's Reply (pgs. 32–33) respond directly to Patent Owner's argument in its Response that "Petitioner fails to identify **how** the combination could be achieved," and do not constitute new argument. *See* Reply 31 (citing Response 117). Similarly, Patent Owner's argument that Dr. Lieberman's annotated illustrations should be disregarded because they do not appear directly in the Petition is misplaced. *See* Sur-reply 63. 37 C.F.R § 42.6(a)(3), cited by Patent Owner, prohibits "arguments" from being incorporated by reference from one document into another document. Dr. Lieberman's Declaration (Ex. 1003) is *testimonial evidence* provided by a witness in support of the Petition—it is not "argument."

Finally, Patent Owner argues Petitioner's motivation to combine Kiss and FIPA97 suffers from "hindsight bias" (Resp. 116) and that Petitioner's combination of FIPA97, Kiss and Cohen "is emblematic of hindsight bias" because Dr. Lieberman "picks and chooses elements" and "superimposes them into one figure in an attempt to 'show' the combination." *Id.* at 84. In particular, Patent Owner argues that "simply drawing in block diagrams with terminology from other references into one cobbled diagram is insufficient as a matter of law without any explanation of how such a combination could be achieved or, indeed, why." *Id.* at 84–85.

We note that "[a]ny judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning, but so long as it takes into

account only knowledge which was within the level of ordinary skill at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper." *In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971).

Here, Petitioner provides persuasive evidence that a person of ordinary skill in the art at the time of the invention would have been motivated to combine FIPA97's communications protocol and inter-agent communication language (FIPA ACL) between the agents of Kiss, adding its administrative functionality and practices to the Kiss system. *See, e.g.*, Pet. 27–31; Ex. 1003 ¶¶ 217–232. This is not evidence of hindsight bias. Patent Owner does not identify, and we do discern, any particular knowledge used by Petitioner in its combination of FIPA97 and Kiss that was gleaned from the '115 patent's disclosure and was not within the level of ordinary skill in the art at the time of the invention.

Patent Owner's criticism of Dr. Lieberman's annotation of Kiss' Figure 8 (*see* Resp. 84–85; Ex. 1003, 130) is also misplaced. As Dr. Lieberman explains, the annotated illustration shows *how* a person of ordinary skill in the art at the time of the invention would have combined FIPA97's ACL messaging, Directory Facilitator, and Facilitator Agent with Kiss' Agent Service Layer. *See* Ex. 1003, 130, Fig. 8. Moreover, Dr. Lieberman persuasively explains *why* a person of ordinary skill in the art would have been motivated to combine the teachings of FIPA97 and Kiss in the manner described. *See* Ex. 1003 ¶¶ 217–231.

We find that Petitioner has shown persuasively by a preponderance of the evidence that one of ordinary skill in the art at the time of the invention would have been motivated to combine the teachings of FIPA97 and Kiss in the manner proffered by Petitioner.

6. Nonobviousness

In determining whether the challenged claims would have been obvious as Petitioner alleges, we must also weigh secondary considerations of nonobviousness, such as commercial success, long-felt but unmet need, failure of others, and unexpected results. *KSR*, 550 U.S. at 406. A nexus is required between the merits of the claimed invention and any objective evidence of nonobviousness if that evidence is to be given substantial weight in reaching a conclusion on obviousness. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1539 (Fed. Cir. 1983). Evidence of secondary considerations is only significant if there is a nexus with respect to the claimed invention. *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1311–12 (Fed. Cir. 2006).

Nexus is a legally and factually sufficient connection between the objective evidence and the claimed invention, such that the objective evidence should be considered in the determination of nonobviousness. *See Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988). For instance, commercial success is relevant if it flows from the merits of the claimed invention. *Sjolund v. Musland*, 847 F.2d 1573, 1582 (Fed. Cir. 1988). The burden of showing nexus is on the patent owner. *In re Huang*, 100 F.3d 135, 139–40 (Fed. Cir. 1996). Objective evidence of nonobviousness also must be commensurate in scope with the claims for which the evidence is offered to support. *In re Kulling*, 897 F.2d 1147, 1149 (Fed. Cir. 1990).

Patent Owner contends that objective indicia of nonobviousness confirms the novelty of the ’115 patent. Resp. 119–145. Patent Owner argues that industry praise for a software application known as “Siri,” “which was first made available for download to iPhone users on Apple,

Inc.'s App Store on February 4, 2010" (*id.* at 121), "bears a nexus to the claims of the '156 Patent" (*id.* at 141).[13] Patent Owner argues that industry praise for the "personal context awareness and service delegation 'technical components' of the Siri application are made possible by the [] claim limitations of independent claim 1 of the '115 Patent." *Id.* at 136.

Patent Owner asserts that "[t]he '115 Patent was based on SRI International's development of version 2 of the Open Agent Architecture ('OAA')." *Id.* at 135 (citing Ex. 2032; Ex. 1001). For support, Patent Owner relies on Exhibit 2054, an SRI web page, which states, "SRI developed OAA® software, which is designed with intelligent 'agents' that track human interactions and work processes to streamline electronic and computer interchange." Resp. 135 (quoting Ex. 2054). Patent Owner further asserts that "[a]fter version 2 of OAA was developed, SRI International spun out Siri, Inc. as an SRI venture, where the Siri application was created based on an OAA groundwork." Resp. 135 (quoting Ex. 2054 ("OAA laid the groundwork for the DARPA-funded CALO project, from which Siri, the first virtual personal assistant, was born. Siri was spun out into an SRI venture that Apple acquired from SRI."). Apple Inc. apparently acquired Siri, Inc. in April 2010, approximately two months after the Siri application's initial release.[14] Resp. 10, 121, 135.

Patent Owner asserts that "Petitioner proposed a combination of *Kiss* with *FIPA97*, which relies on *FIPA97* as teaching a common

---

13 Although Patent Owner refers to the '156 Patent here, we assume this is a mistake and that Patent Owner actually meant to refer to the patent at issue in this proceeding, the '115 patent.

14 We note for the record that the filing date for the '115 patent is Jan. 5, 1999, approximately ten years prior to the Siri application's initial release.

communications and protocol language that is combined with *Kiss*'s teachings of electronic agents and their general functions and operations." Resp. 134 (citing Paper 12, 45). To support this assertion, Patent Owner supposedly quotes from the Decision on Institution in this proceeding as follows:

> In its proposed combination of *Kiss* with *FIPA97*, Petitioner relies on *Kiss* as teaching electronic agents and their general functions and operations, including agent collaboration, agent registry, and interagent messaging. Pet. 28. Petitioner acknowledges, however, *Kiss* does not disclose an inter-agent communication language and relies on *FIPA97* to teach a common communications protocol and language (FIPA ACL), which is combined with the teachings of *Kiss* to provide a communication language for inter-agent communication between the agents of *Kiss*. *Id.*

Resp. 134 (citing Paper 12, 45). However, we cannot locate this supposed quotation from the Decision on Institution in this proceeding on page 45, or on any other page of the Decision, for that matter. *See* Paper 12, 45.

Nonetheless, Patent Owner argues a "nexus between the evidence of industry praise of the Siri application [] and the Challenged Claims can be shown if the industry praise has a nexus to the combination of these (allegedly) prior art features, *i.e.*, the teachings of electronic agents and their general functions and operations in *Kiss* and the common communications protocol and language of *FIPA97*." Resp. 134. Patent Owner argues that its "evidence of industry praise [] satisfies the nexus requirement, as it shows praise for the Siri application's integration of personal context awareness into a service-delegating virtual personal assistant." Resp. 136; *see also id.* at 122–133. Patent Owner also argues that "industry journalists recognized that the Siri application filled an unmet need for a true virtual personal assistant." *Id.* at 141; *see also id.* at 141–145.

To establish a nexus between claim 1 of the '115 patent and the Siri application, Patent Owner provides the following chart. *Id.* at 136–138. Patent Owner relies, in significant part, on the opinion of its declarant, Dr. Medvidovic, to establish a nexus between the Siri application and the claims of the '115 patent. *See* Ex. 2032 ¶¶ 205–229, App. A, 1–32.

Siri's Description of Technology Feature	**Claim 1 of the '115 Patent**
Personal Context Awareness A virtual assistant gives different answers depending on individual preferences and personal context (place, time, history), and if you give it permission, learns more about you so that it can shorten your time-to-task. Information you teach Siri in one domain (e.g. movies) is applied automatically to opportunities rising from other domains. Any personal	"registering a description of each active client agent's functional capabilities as corresponding registered functional capabilities, using an expandable, platform-independent, inter-agent language, wherein the inter-agent language includes: a layer of conversational protocol defined by event types and parameter lists associated with one or more of the

information you provide Siri is stored in a highly secure, PCI-compliant co-location center, and used only with your explicit permission to accelerate your task completion.	events, wherein the parameter lists further refine the one or more events; a content layer comprising one or more of goals, triggers and data elements associated with the events;"
Service Delegation An assistant can reason about what specific set of resources or services would best be combined to help you accomplish a particular task. Siri's patented service delegation algorithms combine numerous attributes about each service provider, including quality scores, fine-grained ratings for specific capabilities, speed measures, and geographic constraints, to plan and execute an optimized strategy for handling your request. Live data is pulled fresh from source sites and world-changing actions are handled in a transaction-safe manner. For example, in a restaurant selection task, Siri integrates information from many sources (local business directories, geospatial databases, restaurant guides, restaurant review sources,	"A computer-implemented method for communication and cooperative task completion among a plurality of distributed electronic agents, comprising the acts of: . . . receiving a request for service as a base goal in the inter-agent language, in the form of an arbitrary complex goal expression; dynamically interpreting the arbitrarily complex goal expression, said act of interpreting further comprising: generating one or more sub-goals expressed in the inter-agent language; constructing a goal satisfaction plan wherein the goal satisfaction plan includes: a suitable delegation of sub-goal requests to best complete the requested

menu sites, online reservation services and the user's own favorites) to show results that meet the user's natural language request.	service request-by using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms; and dispatching each of the sub-goals to a selected client agent for performance, based on a match between the sub-goal being dispatched and the registered functional capabilities of the selected client agent."

Patent Owner argues that "the Siri application's integration of personal context awareness is made possible because of the claimed inter-agent language limitations." Resp. 138 (citing Ex. 2032 ¶ 222). Patent Owner explains that "[b]y having a layer of conversational protocol that has parameter lists, the '115 Patent describes how agents can then use the parameters in the parameter lists to provide feedback or advice to agents who directly, or indirectly through the facilitating agent, receive the service request." Resp. 138. For example, Patent Owner explains that a "requesting agent can utilize such a parameter to provide context on a user's preference to the facilitator agent and/or the tasking agents. *Id.* at 139 (citing Ex. 2032 ¶ 224). Patent Owner argues that "[t]his same functionality of being able to include individual preferences, for example, was described by Siri, Inc. as representing personal context awareness." Resp. 140 (citing Ex. 2040, 2).

Patent Owner also argues that:

> the Siri application's service delegation corresponds to the claimed dynamic interpretation limitations. Siri, Inc. described the service delegation feature of the Siri application as including "an assistant [that] can reason about what specific set of resources or services would best be combined to help you accomplish a particular task." This is precisely what is claimed in the dynamic interpretation limitations, e.g., "constructing a goal satisfaction plan . . . [including] a suitable delegation of sub-goal requests to best complete the requested service request-by using reasoning."

Resp. 140 (citing Ex. 2032 ¶ 221).

Petitioner argues that Patent Owner's "secondary considerations position rests primarily on an unsubstantiated, conclusory opinion that certain aspects of the '115 Patent are embodied in the Apple product 'Siri.'" Reply 82. Petitioner argues that as "Dr. Medvidovic conceded, the evidence he relied on is 'circumstantial,' or a 'suggestion.'" *Id.* (citing Ex. 1129, 147:12-15). Petitioner argues that Dr. Medvidovic "never reviewed the Siri source code, (Ex. 1129, 146:20-147:6), and indeed never even asked to review that source code (Ex. 1129, 147:22-148:9)." Reply 82–83. Petitioner argues,

> [t]he failure to review the code is fatal, because [Dr. Medvidovic] further testified that an "agent"—an element in every claim—is a "piece of functionality that is capable of performing certain tasks that is embodied in at least for a software engineer **a clearly identifiable body of code,"** and that to distinguish an "agent" from any other software he "**would have to look inside the code**."

Id. at 83 (quoting Ex. 1129, 9:14-11:8).

Petitioner faults Patent Owner for not "not seek[ing] that code through a motion for additional discovery or other means, nor did [Petitioner] seek any other objective evidence (such as specifications) to support its assertions." Reply 83. Petitioner also faults Patent Owner for not seeking

the testimony of Mr. Adam Cheyer, one of the named co-inventor's on the '115 patent and a co-founder of Siri, Inc., on this topic, even though Mr. Cheyer's testimony was apparently obtained in a related proceeding. *Id.* at 83–84 (citing Ex. 2034, 58:15-63:16; Ex. 1127); *see also* Resp. 121. During the Oral Hearing in this proceeding, counsel for Patent Owner was asked about this potential source of evidence:

> 12 JUDGE TROCK: Counsel, this is Judge Trock
> 13 again.
> 14 Do you have any evidence from Mr. Cheyer
> 15 that this Siri version that you're discussing right
> 16 now incorporated the claim limitations of the '115
> 17 patent?
> 18 MS. ABDULLAH: Your Honor, we do not have
> 19 any direct evidence from Mr. Cheyer. And the reason
> 20 is because he was never deposed in this
> 21 proceeding and he is also not a consultant or
> 22 anybody that's working with IPA at the moment. I
> 23 know --
> 24 JUDGE TROCK: Wasn't he deposed -- sorry.
> 25 Wasn't he deposed in the Google proceeding?
> 26 MS. ABDULLAH: He was, your Honor. And that
> 1 was pursuant to a subpoena that we had to get
> 2 permission to serve from the Board because he
> 3 refused to simply cooperate with us voluntarily.
> 4 JUDGE TROCK: Was there a reason why you
> 5 didn't approach the Board in this case for a
> 6 subpoena?

MS. ABDULLAH: Your Honor, because we don't believe that his testimony is as probative as the expert testimony that we presented drawing the direct connection as well as the actual industry praise and long-felt need evidence that we --
JUDGE TROCK: But wouldn't he be a witness with personal knowledge of whether or not that original Siri version incorporated the claim limitations of the '115 patent?
MS. ABDULLAH: Your Honor, respectfully, I believe that that was not -- that would not be a question of personal knowledge but rather of expert testimony. And also, your Honor, I would note that I don't believe that we would have the requisite showing under the Garmin factors that he would be able to testify to those aspects.
JUDGE TROCK: But he is the inventor, right? You've told us that.
MS. ABDULLAH: Yes, your Honor, he is the inventor.
TROCK: All right. So he might be a person -- a witness with personal knowledge; isn't that right?
MS. ABDULLAH: Absolutely. And were this a district court case, you know, I'm sure we would have pursued his deposition. I'm sure Microsoft would have as well. But given the high burden for

> us to obtain additional discovery, your Honor, we determined that the probative value of his testimony was not such that it would meet the Garmin factors here.
>
> JUDGE TROCK: But you did pursue that in the Google case though?
>
> MS. ABDULLAH: Your Honor, the Google case was a different issue. The question there had to do with authorship of a prior art reference that Mr. Cheyer was an author of. And it had to do with whether that could be considered the work of another versus the inventor. So inventorship was front and center in the Google proceedings where it is not here. Here this is a 103 analysis for which, you know, obviously I can't pretend to say what the Board would have done. But I think the evidence that we have, that we have been able to present demonstrates that link better than Mr. Cheyer's testimony would be able to.

Paper 42, 114:12–116:26.

Petitioner also points to evidence that potentially undermines a nexus between the challenged claims of the ’115 patent and the Siri application. For example, Petitioner argues that “Adam Cheyer testified that ‘Siri’ did not implement the agent registry functionality described in the ’115 Patent.” Reply 84 (citing Ex. 2034, 46:12-47:5). Likewise, Petitioner argues, “an email authored by Adam Cheyer indicates that as of August 2005 OAAv2 had only been adapted to run on ‘Windows CE’ mobile devices—there is no

mention of iOS, Apple, or any other mobile platforms." Reply 84 (citing Ex. 1137).

Petitioner also argues that Patent Owner's "evidence credits the CALO project with being the progenitor of the ideas that led to Siri—not any version of OAA." Reply 84 (citing Ex. 2042, 1 ("Siri traces its origins to a military-funded artificial-intelligence project called CALO"); Ex. 2044, 1; Ex. 2047, 2; Ex. 2054, 1; Ex. 2001, 2). "Nor is there any evidence in the record," Petitioner argues, "that OAA was ultimately utilized in SRI's CALO project other than that the original OAA (*i.e.*, the version first created in 1994 prior to the '115 Patent work) laid 'groundwork' for what would ultimately become CALO." Reply 84 (citing Ex. 2054). Petitioner argues that "substantial evidence shows that a later agent system named "SPARK" (SRI Procedural Agent Realization Kit) was used as the basis of CALO," but that Patent Owner "ignores this intervening SPARK system and makes no attempt to show it practices the claims, nor does it meaningfully address the CALO project." Reply 85 (citing Ex. 1136 §7).

Petitioner argues that Patent Owner "failed to provide evidence 'that the industry praised a claimed invention or a product that embodies the patent claims.'" Reply 85 (quoting *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1053 (Fed. Cir. 2016) (emphasis omitted). In particular, Petitioner argues, Patent Owner "failed to 'establish that the evidence relied upon traces its basis to a novel element in the claim and not to something in the prior art.'" Reply 85 (quoting *BioMarin Pharm. Inc. v. Genzyme Therapeutic Prods. LP*, IPR2013-00537, Paper 79, 22 (PTAB Feb. 23, 2015) (emphasis omitted).

"Furthermore," Petitioner argues, Patent Owner "has provided no showing that the Siri App 'embodies the claimed features and is co-

extensive with them,' and accordingly can gain no presumption from any Siri success." Reply 85–86 (quoting *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1072 (Fed. Cir. 2018) (emphasis omitted). "Even assuming portions of Siri embodied the claims," Petitioner argues, "the record is undisputed that Siri provides significant functionality well beyond anything covered by the claims—voice recognition, for example." Reply 86.

Petitioner further argues "the table provided by [Patent Owner] merely lists unrelated claim language and 'examples' of 'personal context awareness' with no further analysis." *Id.* at 87. "For example," Petitioner argues, Patent Owner "provides no explanation about how the alleged 'Personal Context Awareness' feature in Siri practices 'a layer of conversational protocol.'" *Id.* Moreover, Petitioner argues, "despite claiming that 'the Siri application's integration of personal context awareness is made possible because of the claimed inter-agent language limitations,' [Patent Owner] provides no evidence. [Patent Owner] cites only to a single paragraph of Dr. Medvidovic's declaration, which is itself bare *ipse dixit* and further undermined by his failure to examine the source code or any other descriptive technical materials for Siri." *Id.* at 88 (citing Ex. 2032 ¶ 222).

Petitioner argues that Patent Owner's evidence that Siri embodies the ICL limitations of claim 1 "is no better." Reply 88 (citing Resp. 140). Petitioner argues Patent Owner:

> does not discuss the actual limitations of claim 1 nor explain how giving different answers depending on individual preferences embodies the claims. For example, [Patent Owner] does not even attempt to articulate how Siri has a conversational layer, or event types, or how those event types are refined by parameters. Nor does [Patent Owner] address how Siri embodies the claimed

> agent registry limitation, particularly when the testimony of the inventor Mr. Cheyer indicates that it does not.

Reply 88 (citing Ex. 2034, 46:12–47:5).

Petitioner argues that Dr. Medvidovic's testimony should be given no weight. Reply 89. Petitioner argues that:

> Dr. Medvidovic admitted that he would be unable to determine whether a piece of software was an "agent" without examining the source code for that software, and further admitted that he had not reviewed the Siri source code nor ever asked to review such source code. Ex. 1129, 11:9–16. Yet, Dr. Medvidovic opines at length that Siri must embody the claims of the '115 Patent because, for example, "personal context awareness and service delegations are made possible by the functionality claimed in the independent claims of the '115 Patent"—an opinion without any evidentiary support. Ex. 2032 ¶ 220. Indeed, by Dr. Medvidovic's own admission, he lacks the necessary personal knowledge to opine on the architecture of Siri.

Reply 89.

In its Sur-reply, Patent Owner argues that there is "no prohibition against the use of circumstantial evidence in IPR proceedings." Sur-reply 66. Patent Owner argues, "Dr. Medvidovic provided unrebutted testimony, including a lengthy appendix, supported by this evidence, which must be credited. *Id.* at 68 (citing Ex. 2032, §§ 205-229, App. A). Patent Owner also points out that "Dr. Medvidovic testified that looking at the code is not the exclusive means of identifying an agent – other available information can be utilized." Sur-reply 69; *See* Ex. 1129, 10:14–11:16. Moreover, Patent Owner argues, "under the *Garmin* factors, Patent Owner was unable to seek Apple's highly confidential source code in connection with these proceedings." Sur-reply 70 (citing *Garmin Int'l, Inc. v. Cuozzo Speed Techs., LLC*, IPR2012-00001, Paper 26 at 6–7 (PTAB Mar. 5, 2013). With respect to Mr. Cheyer's testimony, Patent Owner explains that "Patent

Owner was only able to depose Mr. Cheyer after the Board granted Patent Owner's motion under 37 C.F.R. § 42.52(a) for leave to serve a subpoena to compel Mr. Cheyer to testify" in a related proceeding. Sur-reply 71.

We agree with Petitioner that Patent Owner does not to provide persuasive evidence that the Siri application is reasonably commensurate with the scope of the challenged claims. Patent Owner's cited evidence attempting to tie the Siri application to the limitations of claim 1 relies substantially on the testimony of Dr. Medvidovic (Ex. 2032) and a web.archive .org Internet page (Ex. 2040) Patent Owner identifies as "Siri, Inc., Technology – "About Siri – Your Virtual Personal Assistant." *See* Resp. 136–140 (citing Ex. 2032 ¶¶ 216–222, 224; Ex. 2040).

We note at the outset that Dr. Medvidovic's opinion does not rely on an examination of the Siri application's source code. During his deposition, Dr. Medvidovic testified as follows:

> [Q] Let me ask you, have you ever reviewed the Siri source code?
>
> [A] I have not.
>
> [Q] So you don't know the details of how Siri is implemented?
>
> [A] Not beyond what I'm stating in the declaration as my sources of information that I'm drawing on.

Ex. 1129, 146:10–17. This is significant because Dr. Medvidovic testified at his deposition that an "agent"—an element in every claim—is a "piece of functionality that is capable of performing certain tasks that is embodied in at least for a software engineer a clearly identifiable body of code," and that "if there is no accompanying specification language, then we would have to look inside the code [to determine] what kinds of facilities the agent provides." *See* Ex. 1129, 9:13–11:8). As far as we can determine, neither party has provided "accompanying specification language" for the Siri

application source code. Instead, Dr. Medvidovic testified, the evidence he relied upon to form his opinion is "circumstantial," or a "suggestion." *See* Ex. 1129, 147:7–148:9.

In Section XI.B of his declaration, "Nexus of Industry Praise to the Independent Claims of the '115 Patent," Dr. Medvidovic cites to Exhibit 2040 as support for his understanding of how the Siri application works. *See e.g.*, Ex. 2032 ¶¶ 215–216, 218, 226, 229.

Exhibit 2040 describes "Siri" as:

> the first mainstream consumer application of a Virtual Personal Assistant. Siri is an intelligent software agent designed to have a back-and-forth conversational interaction with you as it helps you get tasks done. The three main technical components behind Siri's differentiation correspond to the essential qualities of an assistant: a conversational interface, personal context awareness and service delegation.

Ex. 2040, 1.

In his declaration, Dr. Medvidovic discusses the "personal context awareness" and "service delegation" aspects of Siri in some detail (s*ee, e.g.*, Ex. 2032 ¶¶ 216–220, 222–229). Dr. Medvidovic, however, only mentions Siri's "conversational interface" in passing, even though Exhibit 2040 describes Siri as an intelligent software agent "designed to have a back-and-forth conversational interaction with you as it helps you get tasks done," and lists Siri's "conversational interface" as the first of Siri's "three main technical components." *See* Ex. 2032 ¶ 215; Ex. 2040, 1.

In his declaration, Dr. Medvidovic attempts to link the Siri application and the limitations of the independent claims of the '115 patent. *See* Ex. 2032 ¶¶ 205–229, App. A, 1–32. Dr. Medvidovic does this by first separating the limitations of independent claims 1 and 29 into two categories, an "Inter-agent Communication Layer" (ICL) and "Service

Request Planning and Execution." *See* Ex. 2032, 70–71. Dr. Medvidovic then states that "[i]t is my opinion that the Siri application's integration of personal context awareness is made possible because of the claimed ICL." *Id.* ¶ 222. Dr. Medvidovic explains that "within the conversational protocol layer of the ICL, there are further claimed "parameter lists" that may "further refine the one or more events." *Id.* ¶ 223. Dr. Medvidovic concludes that "[t]he claimed parameter lists are what allows the Siri application to provide 'different answers' depending on the context, as they are able to refine the meaning of a service request." *Id.* ¶ 226. Dr. Medvidovic, however, provides no citation or further support for this conclusion nor does he point to any evidence to show that the Siri application utilizes the claimed parameter lists. *See id.*

In his declaration, Dr. Medvidovic also states that "[i]t is further my opinion that the Siri application's integration of service delegation is made possible because of the claimed service request planning and execution claim limitations." *Id.* ¶ 227. Dr. Medvidovic attempts to support this opinion by comparing the language of claim 1 relating to a goal satisfaction plan that includes "a suitable delegation of sub-goal requests to best complete the requested service request by using reasoning" to language used in Exhibit 2040 to describe the service delegation feature of the Siri application, "Service Delegation. An assistant can reason about what specific sets of resources of services would best be combined to help you accomplish a particular task." *See id.* ¶ 229; Ex. 2040, 2.

In our view, such a comparison is speculative at best to demonstrate that the Siri application utilizes claim 1's "service request planning and execution limitations," as Dr. Medvidovic opines. The limitations of claim 1 that Dr. Medvidovic puts in this category include:

> A computer-implemented method for communication and cooperative task completion among a plurality of distributed electronic agents, comprising the acts of:
>
> registering a description of each active client agent's functional capabilities as corresponding registered functional capabilities,
>
> receiving a request for service as a base goal in the inter-agent language, in the form of an arbitrary complex goal expression;
>
> dynamically interpreting the arbitrarily complex goal expression, said act of interpreting further comprising:
>
> generating one or more sub-goals expressed in the inter-agent language;
>
> constructing a goal satisfaction plan wherein the goal satisfaction plan includes:
>
> a suitable delegation of sub-goal requests to best complete the requested service request-by using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms; and
>
> dispatching each of the sub-goals to a selected client agent for performance, based on a match between the sub-goal being dispatched and the registered functional capabilities of the selected client agent.

Ex. 2032, 70. Yet, Dr. Medvidovic does not persuasively show that the Siri application "register[s] a description of each active client agent's functional capabilities," "receiv[es] a request for service . . . in the form of an arbitrary complex goal expression," "generat[es] one or more sub-goals expressed in the inter-agent language," "construct[s] a goal satisfaction plan," or "dispatch[es] each of the sub-goals to a selected client agent . . . based on a match between the sub-goal . . . and the registered functional capabilities of the selected client agent." *See id.* ¶¶ 227–229.

In fact, as Petitioner points out, there is evidence of record that the Siri application did not utilize the claimed agent registry functionality as Dr.

Medvidovic opines. According to Petitioner, Mr. Cheyer, the named co-inventor on the '115 patent and the co-founder of Siri, Inc., "testified that 'Siri' did not implement the agent registry functionality described in the '115 Patent." Reply 84 (citing Ex. 2034, 46:12-47:5). At a deposition in a related proceeding, Mr. Cheyer testified as follows:

24 BY MR. HENDERSHOT:
25 Q. So you say "it's likely." Are there
1 features in OAA that you think have yet to be
2 implemented in systems today?
3 MR. HARTSELL: Objection; form.
4 BY MR. HENDERSHOT:
5 Q. Commercial voice-assistance systems.
6 MR. HARTSELL: Objection; form --
7 THE WITNESS: Yes.
8 MR. HARTSELL: -- relevance, outside the
9 scope of direct.
10 THE WITNESS: Yes.
11 BY MR. HENDERSHOT:
12 Q. Could you describe those?
13 MR. HARTSELL: Same objections.
14 THE WITNESS: Every system is different,
15 but one feature of the original OAA 1 demo was that
16 independent agents -- today we would call them more
17 like web services -- could connect dynamically to
18 the -- to the platform, register new capabilities
19 with that platform, and without knowing about other
20 services on the network, explicitly, the user could

> 21 make a single request that would be -- that would
> 22 involve a collaboration, and sometimes competition,
> 23 among those network ecosystem of services.
> 24 And so one user request would be delegated
> 25 to many services which were independently developed,
> 1 and none of those services knew precisely about each
> 2 other. And that when I look at Siri and Google
> 3 Assistant and Alexa and Bixby, that is not a
> 4 capability that I have seen in any of the services
> 5 today.

Ex. 2034, 45:24–46:2, 46:12–47:5

Petitioner also points out, and we agree, that there is evidence of record that credits the CALO project with being the progenitor of the ideas that led to Siri. *See, e.g.*, Ex. 2042, 1 ("Siri traces its origins to a military-funded artificial-intelligence project called CALO"); *see also* Ex. 2044, 1; Ex. 2047, 2; Ex. 2054, 1; Ex. 2001, 2). Opus Research explains that "Siri is set apart because it applies the depth of knowledge its founders and software specialists have built at SRI and elsewhere in creating a "cognitive assistant that learns and organizes" (CALO). Ex. 2044, 1. Petitioner points out that there is also evidence of record that indicates a later agent system named "SPARK" (SRI Procedural Agent Realization Kit) was used as the basis of CALO. *See* Ex. 1136 § 7. The SPARK-based Personal Assistant is described as follows:

> SPARK provides general-purpose agent technology for a range of domains that require reactive task execution. To date, the driving application for SPARK has been the development of an intelligent personal assistant for a high-level knowledge worker. This assistant, called CALO, will be able to perform routine tasks

> on behalf of its user (e.g., arrange meetings, complete online forms, file email), as well as undertake open-ended processes (e.g., purchasing a computer online), and anticipate future needs of its user.

Ex. 1136 § 7. This evidence, however, does not appear to have been considered or addressed by Dr. Medvidovic. *See* Ex. 2032 ¶¶ 205–229.

We are mindful that objective evidence of nonobviousness need only be "reasonably commensurate with the scope of the claims." *Rambus Inc. v. Rea,* 731 F.3d 1248, 1257 (Fed. Cir. 2013). We also bear in mind that "[w]hen the thing that is commercially successful is not coextensive with the patented invention—for example, if the patented invention is only a component of a commercially successful machine or process—the patentee must show prima facie a legally sufficient relationship between that which is patented and that which is sold." *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988).

Here, Patent Owner relies on industry praise for the Siri application and evidence of an unmet need to establish a nexus between the Siri application and the claimed invention. However, we are concerned that Patent Owner and its declarant, Dr. Medvidovic, pay little attention to one of the "three main technical components behind Siri's differentiation," the "conversational interface," when evaluating the basis for the proffered "industry praise." *See* Ex. 2040, 1.

Petitioner argues, and we agree, that "[e]ven assuming portions of Siri embodied the claims, the record is undisputed that Siri provides significant functionality well beyond anything covered by the claims—voice recognition, for example." Reply 86. The impact of Siri's "conversational interface" on Siri's reviewers is notable. For example, MIT Technology Review explains that with Siri, "[u]sers can type or speak commands in

casual sentences, and the software deciphers their intent from the context." Ex. 2042, 1. Opus Research reports that "I've had [Siri] for a couple of days and here are my initial reactions. My overall experience has been quite positive. The quality of voice recognition (powered by the same "engine" that supports Dragon Dictation and Dragon Search on the iPhone) is quite good." Ex. 2044, 1. Fast Company.Com reports, "Siri, which launches today as a free iPhone app, is a virtual personal assistant that amazingly resembles . . . an actual personal assistant. It understands plain English commands, which can be spoken or typed (e.g. "Get me tickets to that Matt Damon movie"). Ex. 2045, 2.

Further, The Chronicle of Higher Education explains that Siri "takes a multi-step search process and turns it into one, simple, voice-driven request." Ex. 2046, 2. USA Today reported that "[t]here were occasional mistakes in speech recognition, but the overall accuracy [of Siri] was impressive, at least when I spoke slowly and clearly in a quiet environment." Ex. 2047, 2. Spatial Computing Strategy & Research reports that, with Siri, "You ask it to do stuff like 'find me a pizza place near me' or 'tell me the weather in Chicago this weekend,' [w]ith your voice or by typing commands." Ex. 2048, 2. Search Engine Land explains that Siri is "intended to enable you to do more with your voice and your phone in fewer clicks or moves." "[O]ne can speak to Siri in a more natural way. Rather than speaking like a robot and saying 'Open Table' to minimize error, you can say something more elaborate and 'conversational' such as, 'I'd like a reservation tonight around 7:30 at Le Cheval.'" Ex. 2050.

Each of these reported examples indicate that the reviews Patent Owner relies upon to demonstrate "industry praise" for the Siri application considered Siri's conversational interface to be a significant part of its

functionality. Unfortunately, Patent Owner and Dr. Medvidovic give Siri's "conversational interface" little, if any, consideration when evaluating the reasons for the "industry praise" used to try and establish a nexus between the Siri application and the claimed invention. *See, e.g.*, Ex. 2032 ¶ 215. Even if the Siri application incorporated some of the functionality of the claimed invention, the evidence of record relied on by Patent Owner shows that the Siri application, and its attendant "industry praise," is not reasonably commensurate with the scope of the claimed invention. Patent Owner does not argue that the Siri application's "conversational interface" is claimed by the '115 patent.

For these reasons, we are not persuaded that Patent Owner's evidence of industry praise for the Siri application, and evidence of an unresolved need, establishes a sufficient nexus between the Siri application and the challenged claims of the '115 patent. If anything, the evidence of record establishes only a weak or vague connection between the Siri application and the claimed invention.

7. Independent Claim 1

Claim 1 is directed to a method for communication and cooperative task completion among distributed electronic agents comprising the steps of registering a description of each active client agent's functional capabilities using an inter-agent language, receiving a request for service as a base goal in the form of an arbitrarily complex goal expression in the inter-agent language, and dynamically interpreting the arbitrarily complex goal expression. Ex. 1001, 29:10–43. Claim 1 also recites that the "inter-agent language" includes a "layer of conversational protocol" and a "content layer." *Id.* at 29:16–24. In addition, claim 1 recites that the step of "dynamically interpreting the arbitrarily complex goal expression"

comprises "generating sub-goals" and "constructing a goal satisfaction plan." *Id.* at 29:28–32. The recited "goal satisfaction plan" in turn includes "a suitable delegation of sub-goal requests" and "dispatching each of the sub-goals to a selected client agent for performance." *Id.* at 29:32–41.

In its proposed combination of Kiss with FIPA97, Petitioner relies on Kiss to teach electronic agents and their general communication and collaboration functions, including the steps recited in claim 1, whereas FIPA97 is relied upon to teach the recited "inter-agent language" and the limitations relating to the inter-agent language, such as "layer of conversational protocol," a "content layer," an "arbitrarily complex goal expression," and "sub-goals expressed in the inter-agent language." Pet. 28, 32–54.

a. Preamble

Claim 1 recites a preamble as follows: "A computer-implemented method for communication and cooperative task completion among a plurality of distributed electronic agents."[15] Petitioner asserts that Kiss teaches the recited "distributed electronic agents" because Kiss describes that "[i]nteraction between a user and the knowledge resources is mediated by a collection of cooperative intelligent agents" (Pet. 32 (citing Ex. 1005, 2:43–49, Fig. 1)), where the agents are "distributed" in a "hierarchical architecture." *Id.* (citing Ex. 1005, Abstract, 2:50–55, 4:57–59).

Petitioner contends that Kiss also teaches the recited "communication and cooperative task completion" among the electronic agents because Kiss

[15] Because Petitioner shows that the recitations in the preamble are satisfied by Kiss, we need not determine whether the preamble is limiting. *See Vivid Techs.*, 200 F.3d at 803.

describes that "cooperative intelligent agents [that] incorporate generalized automated negotiation and distributed inference (i.e. problem-solving) processes," analyze "problem statements," and reorganize them as "sets of tasks." Pet. 33 (citing Ex. 1005, 2:50–55).

Patent Owner does not specifically dispute that Kiss teaches the preamble of claim 1. *See generally* Resp. Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that Kiss teaches the preamble of claim 1.[16]

b. Registering a Description

The first step recited in claim 1 is "registering a description of each active client agent's functional capabilities as corresponding registered functional capabilities." Ex. 1001, 29:13–15. Petitioner asserts that Kiss teaches this limitation because Kiss describes a "registry of agents," which is constructed through "registering a description of each active client agent's functional capabilities as corresponding registered functional capabilities." Pet. 34 (citing Ex. 1005, 3:37–45, 6:66–7:19, 8:41–48, 10:32–35, 12:18–20, Fig. 1).

Patent Owner does not specifically dispute that Kiss teaches this "registering a description" limitation. *See generally* Resp. Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that Kiss teaches

[16] We also find that Patent Owner has waived any argument directed to the preamble of claim 1. *See* Paper 16 (Scheduling Order), 7 ("Patent Owner is cautioned that any arguments for patentability not raised in the response may be deemed waived.").

"registering a description of each active client agent's functional capabilities as corresponding registered functional capabilities," as recited in claim 1.[17]

c. An Inter-agent Language Including a Layer of Conversational Protocol and a Content Layer

Claim 1 recites that "registering a description of each active client agent's functional capabilities" is performed using an "expandable, platform-independent, inter-agent language" (Ex. 1001, 29:13–16) and that the "inter-agent language" includes:

> a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events;
>
> a content layer comprising one or more of goals, triggers and data elements associated with the events.

Id. at 29:16–24. Petitioner asserts that FIPA97's ACL teaches each of these limitations relating to an "inter-agent language." Pet. 34–43.

Patent Owner asserts that FIPA97 does not teach "refin[ing] . . . events" and "triggers" recited in the claim. Resp. 97–108. In addition, Patent Owner argues that FIPA ACL is not "expandable" because, among other reasons, FIPA ACL does not have the capability of refining events. *Id.* at 105–106. Patent Owner does not dispute FIPA97 teaches the rest of the limitations relating to an "inter-agent language" recited in clam 1, as set forth above. *See id.* at 95–108.

[17] We also find that Patent Owner has waived any argument directed to this claim limitation. *See* Paper 16, 7.

i. Inter-agent Language

Petitioner relies on Agent Communication Language of FIPA97 (FIPA ACL) as teaching the "inter-agent language" recited in claim 1. Pet. 28 (citing Exs. 1006, 1007, 1008), 35. In particular, Petitioner contends that FIPA97 discloses Agent Communication Language (ACL) "with precisely defined syntax, semantics and pragmatics" for "communication between independently designed and developed software agents." *Id.* at 35 (citing Ex. 1007, 3).

ii. Platform-independent, Expandable Inter-agent Language

Petitioner asserts that FIPA ACL is "platform-independent," as recited in claim 1, because it is designed to "maximise interoperability across agent-based applications, services and equipment," and to facilitate the "construction and management of an agent system composed of different agents," even when those systems are "built by different developers." Pet. 35 (citing Ex. 1007, vii, ix). Patent Owner does not dispute that FIPA ACL is "platform-independent," as recited in the claim. *See* Resp. 95–108.

Petitioner also contends that FIPA ACL is "expandable," as recited in claim 1, because in FIPA97 "[a]gents may use communicative acts with other names, not defined" in the specification (Pet. 35 (citing Ex. 1007, 12)) and agents "may choose to implement any subset (including all, though this is unlikely) of the pre-defined message types and protocols" (*id.* (citing Ex. 1007, 12)). In addition, Petitioner asserts that in FIPA97 the "formal basis" of the language is "supplemented with pragmatic extensions" that help "ease the practical implementation of effective inter-agent communications." *Id.* (citing Ex. 1007, 11). Petitioner argues that FIPA97

also discloses possible extensions to the inter-agent communication language, such as MIME header support. *Id.* (citing Ex. 1007, 82).

Patent Owner asserts that FIPA ACL is not "expandable" basically for two reasons. Resp. 105–106. First, citing the prosecution history, Patent Owner argues that "the concept of expandability" relates to the feature of "refin[ing] . . . events" recited in the claim and that FIPA ACL is not "expandable" because FIPA ACL does not have the capability of refining events. *Id.* Second, Patent Owner contends that FIPA ACL is not "expandable" in a general sense, citing various criticism of FIPA ACL from "[r]esearchers in the field" regarding FIPA ACL's alleged rigidity and inflexibility in certain aspects. *Id.* at 106. We address each of these arguments in turn.

Addressing first Patent Owner's argument about "the concept of expandability" as it relates to the feature of "refin[ing] . . . events" recited in the claim, Patent Owner cites the following statement by the Examiner in the Notice of Allowability:

> The disclosed agent communication language [KQML] does not read upon the cited agent language because the layer does not define an event type as well as the parameter lists that further *refines the event*. Nwana's language at best has separate layers for the event and the parameters associated with the event. By Applicant providing these parameters in the same layer as the event such that they further *refine the event*, a standard set of events are *dynamically extensible* based upon the parameter list which is not possible with the teachings of Nwana. Therefore, the claims are allowable over the prior art of record.

Ex. 1002, 14 (emphases added); Resp. 105 (citing Ex. 1002, 14). As indicated in the Amendment submitted before the allowance of the claims, claim 1 was amended to recite "wherein the parameter lists further refine the one or more events" to distinguish the claim from the combination of

Nwana/KQML and Kiss cited by the Examiner. *See* Ex. 1002, 13–14, 18, 28, 51. Patent Owner argues, therefore, that the limitation "expandable" recited in claim 1 relates to the feature of the parameter lists that "refine . . . events," as recited in the claim. Resp. 105. Patent Owner asserts that FIPA ACL is not "expandable," as recited, because FIPA ACL does not teach parameters that further refine events. *Id.*

In response, Petitioner asserts that the claim language "*using an* ***expandable****, platform-independent, inter-agent language*" was part of the originally filed claims, which were rejected by the Examiner over the combination of Nwana/KQML and Kiss. Reply 59–60 (citing Ex. 1002, 763). Petitioner argues that, therefore, the Examiner's discussion of "dynamically extensible" events resulting from the "refin[ing] . . . events" feature added in the Amendment is unrelated to the "expandable" language that was present in the claim as originally filed. *Id.* at 60. Petitioner also asserts that, even if the "expandable" language relates to the "refin[ing] . . . events" feature, FIPA ACL is "expandable" because FIPA ACL teaches parameter lists that refine events. *Id.*

We need not determine whether the "expandable" language relates to the "refin[ing] . . . events" feature added in the Amendment because, as discussed below, we agree with Petitioner that FIPA ACL teaches "parameter lists" that "further refine the one or more events," as recited in claim 1. Thus, to the extent Patent Owner asserts that the limitation "expandable" recited in claim 1 relates to the feature of the parameter lists "refin[ing] . . . events," Petitioner demonstrates sufficiently that FIPA ACL teaches an "expandable . . . inter-agent language."

Turning to the Specification, the '115 patent describes that "[a]s new agents connect to the facilitator, *registering* capability specifications and

natural language vocabulary, what the user can say and do *dynamically changes*; in other words, the ICL is dynamically *expandable*." Ex. 1001, 8:41–44 (emphases added). That is, the '115 patent suggests that the expandability of the ICL (or "inter-agent language," as recited in claim 1) results from or flows from the ICL's feature of "registering capability specifications and natural language vocabulary."[18] *Id.* As noted in the Institution Decision, this portion of the Specification appears to describe an exemplary embodiment. Inst. Dec. 54 (citing Ex. 1001, 8:40–49).

As discussed above, Petitioner demonstrates sufficiently Kiss teaches "registering a description of each active client agent's functional capabilities as corresponding registered functional capabilities," as recited in claim 1. Thus, to the extent the portion of the Specification discussed above describes an embodiment of an "expandable . . . inter-agent language," we are persuaded that the combination of Kiss and FIPA97 teaches "registering a description of each active client agent's functional capabilities as corresponding registered functional capabilities, using an expandable, platform-independent, inter-agent language," as recited in claim 1 (*see* Pet. 33–35).

Next, Patent Owner asserts that FIPA ACL is not "expandable" in a more general sense, citing various "criticisms" from "[r]esearchers in the field" about FIPA ACL's alleged "rigidity and lack of expandability." Resp. 106 (citing Ex. 2031, 2 ("[i]t is unlikely that a single set of axioms will cover all eventualities because communication is inherently context dependent");

[18] As described in the Specification, agents connecting to the facilitator is part of the operation of the system of the '115 patent, not a feature of the ICL. *See* Ex. 1001, 6:24–44; 7:13–32.

Ex. 1081, 2 ("[T]he current FIPA-ACL spec tends to unnecessarily over-constrain the feasibility of communication acts . . . ."). Patent Owner also contends that Petitioner's declarants, Dr. Finin and Dr. Lieberman, made allegedly similar statements. *Id.* (citing Ex. 1082, 2 ("The FIPA proposal only covers the most rudimentary message types."); Ex. 2014, 207:5–20 ("FIPA is a standard, like a miles-per-gallon standard . . . So that doesn't say how you're going to build a car; it just says a car has to get . . . 50 miles a gallon.")).

We are not persuaded by Patent Owner's argument and evidence because Patent Owner does not explain adequately why the cited extrinsic evidence regarding FIPA ACL's alleged "rigidity" or inflexibility in certain aspects shows that FIPA ACL is not "expandable" as recited in the claim. In the Institution Decision, based on the preliminary record, we did not find anything in the intrinsic record that justifies deviating from the plain meaning of the claim term "expandable." Inst. Dec. 54–55. Upon considering the complete record, we discern no reason to depart from our preliminary assessment.[19]

We may "at any time in order to better understand the underlying technology and may also rely on dictionary definitions when construing claim terms, so long as the dictionary definition does not contradict any

[19] In the Patent Owner Response, Patent Owner does not discuss the Specification or argue that the meaning of "expandable" recited in the claim can be discerned from the Specification, although we invited the parties in the Institution Decision to address the term "expandable" further in their papers during trial. *See* Resp. 105–107 (citing Inst. Dec. 55–56). Thus, Patent Owner has waived its argument regarding the meaning of "expandable" based on any disclosures in the Specification. *See* Paper 16, 7.

definition found in or ascertained by a reading of the patent documents." *Phillips*, 415 F.3d at 1322–23 (citation omitted). Accordingly, in the Institution Decision, finding no readily discernable meaning of "expandable" in the intrinsic record, we consulted a technical dictionary, the 7th edition of the IEEE Dictionary (Ex. 3001).[20] The IEEE Dictionary defines "expandability" as follows: "**expandability (1) (supervisory control, data acquisition, and automatic control)** The capability of a system to be increased in capacity or provided with additional functions. **(2)** *See also:* extendability." Ex. 3001, 3.[21] The same dictionary defines "extensible language" as follows.

> A computer language that can be altered or can alter itself to provide a programmer with additional user-specified functions or capabilities. Examples include Ada, ALGOL, FORTH, and LOGO, because each can be used in a building block fashion to construct increasingly complex functions.

Id. at 4. Upon considering the complete record, we determine that these dictionary definitions are consistent with the intrinsic record, including the description of an embodiment in the Specification regarding "the ICL [being] dynamically expandable." *See* Ex. 1001, 8:41–44.

In the Institution Decision, based on the preliminary record, we found that the characteristics of FIPA ACL argued by Petitioner—such as the ability to use communicative acts with other names not defined in the language specification, the pragmatic extensions, and the MIME

---

[20] IEEE 100 THE AUTHORITATIVE DICTIONARY OF IEEE STANDARDS TERMS (7th ed. 2000) (Ex. 3001).

[21] The page numbers for Exhibit 3001 refer to the page numbers inserted in the bottom, right-hand corner of each page.

extension—appear to fall within the plain meaning of the term "expandable," as defined in the IEEE Dictionary. Inst. Dec. 55; *see* Pet. 35 (citing Ex. 1007, 11, 12, 82). Patent Owner does not argue otherwise. *See* Resp. 105–107. Based on the complete record and for the reasons discussed above, we determine that Petitioner has shown sufficiently that the combination of Kiss and FIPA97 teaches "registering a description of each active client agent's functional capabilities as corresponding registered functional capabilities, using an expandable, platform-independent, inter-agent language," as recited in claim 1.

iii. A Layer of Conversational Protocol Defined by Event Types and Parameter Lists Associated With the Events

Claim 1 recites that the "inter-agent language" includes "a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events." Ex. 1001, 29:16–21. Petitioner contends that FIPA97 teaches each of these limitations. Pet. 36–41. Patent Owner asserts that FIPA97 does not teach "the parameter lists further refine the one or more events," as recited in claim 1. Resp. 97–107.

(1) A Layer of Conversational Protocol

Petitioner asserts that FIPA97 teaches "a layer of conversational protocol" recited in claim 1 because FIPA ACL "defines the semantics of *messages* between agents as including a communicative act, followed by various parameters and parameter expressions," as shown in Figure 1 of Part 2 of FIPA97 reproduced above in the Overview of FIPA97 section (§ III.C.2.). Pet. 36 (emphasis added) (citing Ex. 1007, 2; Ex. 1003 ¶ 235). Petitioner also argues that FIPA97 "discloses a number of different

performatives and rules governing FIPA ACL messages and the meaning of the different parts" and, therefore, discloses "a layer of conversational protocol." *Id.* at 36–37 (citing Ex. 1007, 11–22; Ex. 1003 ¶¶ 236–239).

(2) Events and Event Types

As discussed above in Section III.B. (Claim Construction), we construe "event" to mean "a message or goal communicated between agents" and "event type" to mean "a type of an event" for this Final Written Decision.

Petitioner maps the "event" of claim 1 to FIPA ACL's "message" and asserts that FIPA ACL's "message type" teaches an "event type" recited in claim 1. Pet. 37–38 (citing Ex. 1007, 3, 4, 11–13, 18; Ex. 1003 ¶¶ 243, 246, 247). Petitioner argues that FIPA ACL's "message" is an "event" recited in claim 1 because the FIPA ACL communicative acts "are performed by an agent sending a *message* to another agent." *Id.* at 37 (emphasis added) (citing Ex. 1007, 3, 4, 11; Ex. 1003 ¶ 243).

Referencing Figure 1 of Part 2 of FIPA97 reproduced above, Petitioner asserts that in FIPA ACL, "[t]he first element of the message is a word which identifies the communicative act being communicated, which defines the principal meaning of the message," and "the message's communicative act *type* corresponds to that which in KQML is called the performative." Pet. 37 (emphasis added) (citing Ex. 1007, 12, 13; Ex. 1007 ¶ 244). Petitioner argues that FIPA97 further defines "message type" as corresponding to the "communicative acts/performatives of the FIPA ACL." *Id.* at 38 (citing Ex. 1007, 18; Ex. 1003 ¶ 246).

As discussed above, Petitioner asserts that FIPA97 teaches "a layer of conversational protocol" because FIPA ACL "defines the *semantics of*

messages between agents as including a communicative act." Pet. 36 (emphasis added) (citing Ex. 1007, 12). Petitioner contends that FIPA97 teaches the layer of conversational protocol in FIPA ACL is "defined by event types," as recited in claim 1, because in FIPA97, "**[t]he message types are a reference to the semantic acts defined in this specification**." *Id.* at 37–38 (underlined emphases added) (citing Ex. 1007, 11).

(3) Parameter Lists

Claim 1 recites that "a layer of conversational protocol" is also "defined by . . . parameter lists associated with one or more of the events." Petitioner asserts that in FIPA97, FIPA ACL messages may include multiple different parameters ("parameter lists associated with one or more of the events") that can "help the message transport service to deliver the message correctly" or "the receiver to interpret the meaning of the message," or "to respond co-operatively," as shown in Figure 1 of Part 2 of FIPA97 (reproduced above). Pet. 38–39 (citing Ex. 1007, 12, 14, Fig. 1). Petitioner contends that FIPA97 discloses additional parameters in Table 1. *Id.* at 39 (citing Ex. 1007, 13–14).

(4) Refining Events

Claim 1 recites that "the parameter lists further refine the one or more events." Petitioner asserts that this phrase should be construed to mean that "a list of parameters associated with an event can refine the event by affecting the meaning of the event." Pet. 13. Petitioner discusses the disclosures in the Specification and the prosecution history of the '115 patent in support of its proposed construction. *Id.* at 13–16 (citing Ex. 1001, 11:2–37; Ex. 1002, 13–14, 51, 55; Ex. 1020, 5, 6; Ex. 1003 ¶¶ 90, 91, 93–98).

Although Patent Owner discusses constructions for six terms in the Patent Owner Response, Patent Owner does not discuss Petitioner's proposed construction for the claim term "refine . . . events" or proposes its own construction. *See* Resp. 24–38. Instead, Patent Owner argues that FIPA97 does not teach parameters that "refine . . . events" under Petitioner's proposed construction. *See* Resp. 97–98 ("the cited parameters in FIPA97 do not, contrary to Petitioner's assertion, affect the meaning of the message"), 100 ("this parameter **does not** affect the **meaning** of the message"), 102 ("In contrast, the FIPA97 "receiver" parameter **does not affect the meaning of the "inform" communicative act**."). Based on the arguments and evidence presented by Patent Owner, we understand Patent Owner not to dispute Petitioner's proposed construction for the term "the parameter lists further refine the one or more events."[22]

Upon considering the complete record, we agree with Petitioner that the claim term "refine . . . events" encompasses "affecting the meaning of the events." As discussed above, during prosecution, the limitation "wherein the parameter lists further refine the one or more events" was added to claim 1 in an amendment to distinguish the claim from the combination of Nwana/KQML and Kiss cited by the Examiner. *See* Ex. 1002, 13–14, 18, 28, 51; Pet. 14–16 (citing Ex. 1002, 13–14, 51); Resp. 105 (citing Ex. 1002, 14). Citing the disclosures of Nwana/KQML discussed by the Examiner, Petitioner persuasively argues that the parameters of Nwana's KQML message (i.e., the claimed "event") "tell" do not change the meaning of the message, whereas the parameters of an event of the '115 patent's change the

[22] We also find that Patent Owner has waived any argument regarding claim construction of this term. *See* Paper 16, 7.

meaning of the event by "refin[ing] the event." Pet. 14–16 (citing Ex. 1002, 13–14, 51, 55; Ex. 1020, 5, 6). In support of its argument, Petitioner cites the following passage from the Specification that distinguishes the '115 patent's ICL (i.e., the recited "inter-agent language") from KQML.

> For example, in KQML, a request to satisfy a query can employ either of the performatives ask_all or ask_one. In ICL, on the other hand, this type of request preferably is expressed **by the event type evost solve, together with the solution_limit(N) parameter--where N can be any positive integer**. (A request for all solutions is indicated by the omission of the solution limit parameter.) [The request can also be accompanied by other parameters, which combine to <u>further refine</u> its semantics.] In KQML, then, this example forces one to choose between two possible conversational options, neither of which may be precisely what is desired. In either case, the performative chosen is a single value that must capture the entire conversational characterization of the communication.

Pet. 13 (alteration and underlined emphasis added) (quoting Ex. 1001, 11:21–37). Petitioner argues that a message having the KQML performative "ask_all" always has the same meaning, requesting all solutions to the request, just as the KQML performative "ask_one" always requests one solution. *Id.* at 14. According to Petitioner, in contrast, the meaning of the '115 patent's event "evost_solve" depends on the value of its parameter "solution_limit(N)"—e.g., an agent may request the identity of three agents capable of translating a document by including "solution_limit(N)" in the message and setting the value of N to 3. *Id.* Thus, Petitioner argues that the parameters of an event of the '115 patent affect the meaning of the event. *Id.* at 13–16.

We are persuaded by Petitioner's argument and evidence that the "parameterized approach" of the '115 patent (Ex. 1001, 11:16–21) can refine an event by changing the meaning of the event. As discussed above in

Section III.B., we construe "event" to mean "a message or goal communicated between agents" and "goal" to mean "a request for service." The '115 patent describes that "[i]n one embodiment, a request for one of an agent's services normally arrives in the form of an *event* from the agent's facilitator." *Id.* at 12:44–46 (emphasis added). In a section titled "Refining Service Requests," the '115 patent describes as follows:

> In a preferred embodiment of the present invention, *parameters* associated with a goal (or sub-goal) can draw on useful features to *refine the request's meaning*. For example, it is frequently preferred to be able to specify whether or not solutions are to be returned synchronously; this is done using the reply parameter, which can take any of the values synchronous, asynchronous, or none. As another example, when the goal is a non-compound query of a data solvable, the cache parameter may preferably be used to request local caching of the facts associated with that solvable.

Id. at 15:49–58 (emphases added). Thus, the '115 patent describes that in an embodiment, parameters of a request for service, i.e., an event, can refine the "meaning" of the request or event.

Nonetheless, we note that this passage and all of the disclosures of the '115 patent cited by Petitioner describe exemplary embodiments. *See id.* at 11:25–28 ("In ICL . . . this type of request *preferably* is expressed by the event type evost solve, together with the solution_limit(N) parameter--where N can be any positive integer." (emphasis added)), 15:49–51 ("In a *preferred embodiment* of the present invention, *parameters* associated with a goal (or sub-goal) can draw on useful features to *refine the request's meaning*." (emphases added)). Thus, the term "refine . . . events" recited in claim 1 may encompass but is not necessarily limited to "affecting the meaning of events." *See SuperGuide*, 358 F.3d at 875 ("a particular embodiment appearing in the written description may not be read into a claim when the

claim language is broader than the embodiment"); *WesternGeco*, 889 F.3d at 1323–24 ("It is well established that claims are not limited to preferred embodiments, unless the specification clearly indicates otherwise."). Indeed, Petitioner's proposed construction of the term "the parameter lists further refine the one or more events" expresses the meaning of the term in a permissive fashion—"an event *can* refine the event by affecting the meaning of the event." Pet. 13 (emphasis added).

Based on the complete record, we determine that the term "the parameter lists further refine the one or more events" encompasses parameters "affecting the meaning of the events."

Petitioner asserts that FIPA97 teaches the limitation "the parameter lists further refine the one or more events" because several of the conversational layer parameters disclosed in FIPA97 affect the meaning of the performative included within the message, and therefore affect the meaning of the message, or event. Pet. 40. According to Petitioner, FIPA97 discloses a parameter ":receiver," which "can alter the meaning [of] an event, such as 'inform,' to be 'inform one'" or "inform a number' of agents, depending on the value of the parameter." *Id.* (citing Ex. 1007, 13). Citing the testimony of Dr. Lieberman, Petitioner asserts that naming a tuple "corresponds to the action of multicasting the message" such that "semantics of this multicast" is refined so that "the message is sent to each agent named in the tuple." *Id.* (citing Ex. 1007, 13; Ex. 1003 ¶ 258). Petitioner also argues, "[t]his 'tuple naming' functionality is analogous to the example provided in the '115 Patent of 'solution_limit(N),' in which 'N' modifies how many solutions are requested, and is not found in the KQML Nwana reference that was before the examiner." *Id.* (citing Ex. 1001, 11:16–42; Ex. 1020; Ex. 1003 ¶ 258). Petitioner also asserts that FIPA97 discloses two

other parameters—":protocol" when used with the "call for proposals" performative and ":conversation-id"—that affect the meaning of a message. *Id.* at 40–41 (citing Ex. 1007, 13–14, 46–49; Ex. 1003 ¶¶ 261–265).

Patent Owner asserts that FIPA97 does not teach parameters "refin[ing] . . . events," as recited in the claim, because the parameters of FIPA97 cited by Petitioner does not affect the meaning of the message. Resp. 97–98. In particular, Patent Owner contends that FIPA97's ":receiver" parameter of the FIPA97 "inform" message relied upon by Petitioner is no different from KQML's ":receiver" parameter for the KQML "tell" message in that both modify the message but do not affect the meaning of the message. *Id.* at 98–99 (citing Ex. 1007, 12; Ex. 1020, 5). Patent Owner asserts that FIPA97's ":receiver" parameter does not affect the meaning of the FIPA97 "inform" message because "the result of this parameter is only that the message is multicast; i.e., it is 'sent to each agent named in the tuple.'" *Id.* at 100. According to Patent Owner, "the content of the message is unchanged; the only thing that changes is who (as in, recipient) receives the message." *Id.* at 101.

The portion of FIPA97 cited by Petitioner is reproduced below.

Message Parameter:	Meaning:
:sender	Denotes the identity of the sender of the message, i.e. the name of the agent of the communicative act.
:receiver	Denotes the identity of the intended recipient of the message. Note that the recipient may be a single agent name, or a tuple of agent names. This corresponds to the action of multicasting the message. Pragmatically, the semantics of this multicast is that the message is sent to each agent named in the tuple, and that the sender intends each of them to be recipient of the CA encoded in the message. For example, if an agent performs an inform act with a tuple of three agents as receiver, it denotes that the sender intends each of these agent to come to believe the content of the message.

Ex. 1007, 13. Pointing to this disclosure in FIPA97, Petitioner asserts that the "receiver" parameter affects the meaning of the event by affecting "whether the performative communicates the message to a single agent, a selection of agents, or if [the message is] broadcast to every agent." Reply 56 (citing Ex. 1007, 13). According to Petitioner, "in FIPA97, an event using 'inform' can *mean three or more different things* (i.e., inform (1) one person, (2) a select group of people, (3) everybody) depending on the value of just that parameter." *Id.*

We agree with Petitioner's argument and disagree with Patent Owner's argument. As shown above in the portion of FIPA97 relied on by Petitioner, FIPA97 describes the "meaning" of the message affected by the ":receiver" parameter (under the column heading "Meaning:") as follows:

> Note that the recipient may be a single agent name, or a tuple of agent names. This corresponds to the action of multicasting the message. Pragmatically, the semantics of this multicast is that the message is sent to each agent named in the tuple, and that the sender *intends* each of them to be recipient of the CA encoded in the message. For example, if an agent performs an inform act

> with a tuple of three agents as receiver, it denotes that the sender *intends* each of these agent to come to believe the content of the message.

Ex. 1007, 13 (emphases added). We agree with Petitioner this passage describes, under the column heading "Meaning," the meaning of the message modified or affected by the ":receiver" parameter.

Patent Owner argues that the FIPA97 ":receiver" parameter does not change "the content of the message" and that "the only thing that changes is who (as in, recipient) receives the message." Resp. 101. Patent Owner contends that, in contrast, the solution_limit(N) parameter of the '115 patent "modifies the actual request/communicative act/performative itself—i.e., **evost solve**, because it imposes a modification on the limits of **solution**s presented in response to a request." *Id.* at 102 (citing Ex. 2032 ¶161).

We are not persuaded by Patent Owner's argument. First, we disagree with Patent Owner that the FIPA97 ":receiver" parameter changes only "who (as in, recipient) receives the message." As described in FIPA97, the ":receiver" parameter does not merely specify "who receives the message," e.g., agent A as opposed agent B. Rather, as persuasively explained by Petitioner, the ":receiver" parameter affects the qualitative aspect of the message—i.e., whether to inform (1) one agent, (2) a select group of agents, or (3) every known agent. *See* Reply 56.

In addition, Patent Owner does not explain adequately why the solution_limit(N) parameter of the '115 patent specifying the number of agents to be queried "modifies the actual request/communicative act/performative itself" but the ":receiver" parameter of FIPA97 specifying the number of agents to which to send a message does not. *See* Resp. 100–101. We agree with Petitioner that Patent Owner does not identify "a

practical distinction between limiting the number of agents to be queried (solution_limit(N)), and querying a selection of agents (:receiver)." Reply 57.

Next, Patent Owner contends that FIPA97 does not teach parameters "refin[ing] . . . events," as recited in the claim, because FIPA97's ":receiver" parameter is the same as or similar to the KQML ":receiver" parameter, which does not modify the meaning of a message. Resp. 98–99 (citing Ex. 1007, 12; Ex. 1020, 5). In support of its argument, Patent Owner cites a page from Dr. Finin's presentation slides at an unidentified meeting or class, which compares "KQML tell and FIPA ACL inform." *Id.* 99–100 (citing Ex. 2019, 15; Ex. 2013, 132:6–22.). Patent Owner also cites the testimony from Dr. Finin at his deposition that "the general idea of agent communication language that was embodied in KQML is similar to the one that is embodied in FIPA." *Id.* at 100 (citing Ex. 2012, 32:10–17).

Patent Owner, however, does not discuss the disclosure of KQML/Nwana (Ex. 1020) sufficiently (other than pointing to the similarity of the format between the ":receiver" parameter of KQML and FIPA97) or explain adequately why KQML's ":receiver" parameter is similar to the FIPA97 ":receiver" parameter. *See* Resp. 98–100. For example, Patent Owner does not explain whether KQML's ":receiver" parameter specifies, similar to FIPA97, that "the recipient may be a single agent name, or a tuple of agent names," that "the message is sent to each agent named in the tuple," and that "the sender *intends* each of them to be recipient of the message." *See id.*; Ex. 1007, 13 (emphasis added). The general statements from Dr. Finin (or a slide purportedly from his unidentified presentation) cited by Patent Owner (Resp. 99–100 (citing Ex. 2019, 15; Ex. 2013, 132:6–22, 32:10–17) regarding the alleged similarity between KQML and FIPA97 at a

general level are simply insufficient to override the specific disclosures in FIPA97 cited by Petitioner regarding the meaning of the message modified or affected by the FIPA97 ":receiver" parameter.

Patent Owner also cites testimony from Petitioner's declarant, Dr. Lieberman, as "confirm[ing]" that the FIPA97 ":receiver" parameter does not change "the content of the message" and that "the only thing that changes is who (as in, recipient) receives the message." Resp. 101 (citing Ex. 2014, 110:14–111:16, 168:5–12). The cited testimony of Dr. Lieberman, however, discusses FIPA97's messages and multicasting in general (responding to general questions from Patent Owner's counsel) and does not discuss the specific disclosure in FIPA97 cited by Petitioner regarding the meaning of the message modified or affected by the FIPA97 ":receiver" parameter. *See* Ex. 2104, 108:4–111:16, 168:5–12. Thus, we find the testimony of Dr. Lieberman cited by Patent Owner to be unpersuasive (if not misleading) to "confirm" that the FIPA97 ":receiver" parameter does not change "the content of the message" and that "the only thing that changes is who (as in, recipient) receives the message." *See* Resp. 101.

Next, Patent Owner cites 9 paragraphs from the Declaration of Dr. Cohen (Ex. 2033) to argue that "FIPA97 does not contain any conversational layer parameters that affect the semantics of FIPA97 messages." Resp. 103 (citing Ex. 2033 ¶¶ 80–89).[23] Patent Owner, however, does not discuss Dr. Cohen's testimony in the Patent Owner Response or explain how Dr. Cohen's testimony supports its contention. *See*

[23] Patent Owner's citation to the Cohen Declaration appears to be mistaken since the last paragraph of Cohen Declaration is paragraph 88.

id. Thus, to the extent Petitioner purports to rely on Dr. Cohen's testimony, this amounts to improper incorporation by reference in violation of 37 C.F.R. § 42.6(a)(3). Accordingly, we decline to consider the cited paragraphs from the Cohen Declaration. We note, nonetheless, that Dr. Cohen's testimony appears to dwell in generalities, e.g., citing the works of logicians/philosophers Tarski and Frege (*see* Ex. 2033 ¶¶ 80–81), and discusses tuples and multicasting in general terms (*see id.* ¶¶ 85–88).

Lastly, Patent Owner contends that the limitation "the parameter lists further refine the one or more events" requires "the parameters of an event (or message) can refine the message or goal itself" (Resp. 97) or "change the nature of the communicative act itself" (*id.* at 102). Although it is not entirely clear what Patent Owner argues,[24] to the extent Patent Owner argues "refin[ing]" a messages or goal requires changing the message or goal itself, we disagree with Patent Owner's argument. As discussed above, in a section titled "Refining Service Requests," the '115 patent describes examples of "parameters" associated with a request or goal that "refine the request's meaning," including the "reply parameter" that specifies whether solutions are to be returned synchronously or asynchronously, and the "cache parameter" that specifies local caching of facts related to the request. *See* Ex. 1001, 15:49–58. These parameters do not appear to change the request itself but, rather, specify how the request should be handled—e.g., synchronous response, local caching, etc. Thus, we are not persuaded by Patent Owner's argument that the claim requires the recited "parameters"

[24] As discussed above, Patent Owner does not dispute Petitioner's proposed construction of the term "the parameter lists further refine the one or more events." *See* Resp. 24–38.

"refine the message or goal itself" (Resp. 97) or "change the nature of the communicative act itself" (*id.* at 102). Such an interpretation, which "excludes a [disclosed] embodiment from the scope of the claim is rarely, if ever, correct." *Broadcom Corp. v. Emulex Corp.*, 732 F.3d 1325, 1333 (Fed. Cir. 2013) (quoting *Accent Pkg., Inc. v. Leggett & Platt, Inc.*, 707 F.3d 1318, 1326 (Fed. Cir. 2013)) (citing *Phillips*, 415 F.3d at 1312–13).

Based on the foregoing and upon considering the complete record, we determine that Petitioner has shown sufficiently that FIPA97 teaches "wherein the parameter lists further refine the one or more events," as recited in claim 1. Based on the complete record and for the reasons explained by Petitioner, we determine that Petitioner has shown sufficiently that FIPA97 teaches "a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events," as recited in claim 1.

iv. Content Layer Comprising Goals and Triggers

Claim 1 recites that the "inter-agent language" includes "a content layer comprising one or more of goals, triggers and data elements associated with the events." Petitioner asserts that FIPA97 teaches the recited "content layer" because FIPA97 describes various rules and standards governing the content that may be embedded within messages ("a content layer"). Pet. 42 (citing Ex. 1007, 3, 9, 14–16). Petitioner argues that the '115 patent consistently explains that the "content layer" of the disclosed ICL "consists of the specific goals, triggers, and data elements that may be *embedded* within various events." *Id.* at 9 (Ex. 1001, 11:13–15).

Petitioner also contends that FIPA97 teaches "a content layer comprising one or more of goals . . . associated with the events" because in

FIPA97 "*goals* can be communicated among agents through the use of an achieve domain-language primitive." Pet. 42 (emphasis added) (citing Ex. 1007, 81).

Petitioner asserts that FIPA97 also teaches "data elements associated with the events" because FIPA ACL supports content expression through objects and other data ("data elements") associated with various performatives. Pet. 43 (citing Ex. 1007, 14).

(1) Triggers

Petitioner asserts that a "trigger" recited in claim 1 is "a general mechanism for requesting some action be taken when one or more conditions is met." Pet. 11 (citing Ex. 1001, 21:21–22:31; Ex. 1003 ¶¶ 80–81). Patent Owner does not dispute Petitioner's proposed meaning of "trigger" (*see* Resp. 24–38) and argues that FIPA97 does not teach triggers under Petitioner's interpretation of the term (*see id.* at 107–108). We adopt this undisputed interpretation of "trigger" for this Final Written Decision because the construction is consistent with the disclosure in the Specification. *See* Ex. 1001, 21:22–24 ("triggers [provide] a general mechanism for requesting some action be taken when a set of conditions is met").

Petitioner asserts that FIPA97 discloses "triggers" for various performative actions within the content layer, including for use with the performative "accept-proposal" which "informs the receiver that it intends that (at some point in the future) the receiving agent will perform the action, once the given *precondition* is, or becomes, true." Pet. 43 (emphasis added) (citing Ex. 1007, 23). Petitioner argues that FIPA97 also discloses that the performative "propose" can be used "to make a proposal or respond to an

existing proposal during a negotiation process by proposing to perform a given action subject to certain *conditions* being true." *Id.* (emphasis added) (citing Ex. 1007, 34; Ex. 1003 ¶¶ 277–279).

Petitioner argues that the '115 patent describes "triggers" as "providing a general mechanism for requesting some action be taken when a set of *conditions* is met," and that such triggers "preferably specif[y] at least a *condition* and an action . . . [t]he *condition indicates under what circumstances the trigger should fire,* and the action indicates what should happen when it fires." Pet. 11 (emphases added) (citing Ex. 1001, 21:21–34).

Patent Owner contends that the portions of FIPA97 cited by Petitioner do not describe "a settable trigger that kicks in when a specified event takes place." Resp. 108. Patent Owner asserts that the communicative acts (or performative actions) cited by Petitioner instead are "performatives that contain parameters dictating what the associated action is." *Id.* at 107 (citing Ex. 2032 ¶¶ 168–169).

Patent Owner also cites 35 paragraphs from the Cohen Declaration in support of its argument. *Id.* at 108 (citing Ex. 2033 ¶¶ 30–64). Patent Owner, however, does not discuss Dr. Cohen's testimony in the Patent Owner Response or explain how Dr. Cohen's testimony supports its contention. *See id.* at 107–108. Thus, to the extent Petitioner purports to rely on Dr. Cohen's testimony, this amounts to improper incorporation by reference in violation of 37 C.F.R. § 42.6(a)(3). Accordingly, we decline to consider the cited paragraphs from the Cohen Declaration.

Petitioner argues that the performative "accept-proposal" "informs the receiver that it intends that (**at some point in the future**) the receiving agent will perform the action, once the given precondition is, **or becomes**, true."

Reply 63 (citing Ex. 1007, 23). Petitioner cites the following testimony from Dr. Lieberman:

> [T]he "precondition" is sent to an agent through the "*content layer*," then at some future point when that "precondition" is met the receiving agent will "*trigger*" and take an action based upon the information encoded in the "*content layer*" of the message. **EX1007, 23**.

Id. (citing Ex. 1003 ¶ 276). Pointing to the description in the cited portion of FIPA97, Petitioner argues

> [A]s explained by Dr. Lieberman, and shown in FIPA97, the performative "accept-proposal" ("[a] general mechanism for requesting") will take an action—in this example, streaming a multimedia channel ("some action be taken")—when "the customer is ready" ("when one or more conditions is met"). Further, the example above shows how this trigger information is stored within the "*content layer*."

Id. at 64 (reproducing the description of the performative "accept-proposal" in Ex. 1007, 23).

Petitioner contends that Dr. Lieberman and the Petition describe many other possible triggers, including the "propose" performative and the "request-when" performative. *Id.* at 65. Petitioner asserts that the "propose" performative "informs the receiver that the proposer will adopt the intention to **perform the action once the given precondition is met**" (*id.* (citing Ex. 1007, 34; Ex. 1003 ¶¶ 277–279; Pet. 43)) and that the "request-when" performative is used when "[t]he sender wants the receiver to perform some action **when some given proposition becomes true**" (*id.* (citing Ex. 1007, 40; Ex. 1003 ¶ 414; Pet. 63–64)). Petitioner points to the description of the "request-when" performative in FIPA97 and argues that the performative "request-when" ("[a] general mechanism for requesting") will take an action—in this example, sending a message ("some action be taken")—

when "an alarm occurs" ("when one or more conditions is met"). *Id*. at 66. Petitioner concludes that FIPA97, therefore, discloses multiple "triggers" recited in claim 1. *Id.*

Patent Owner does not dispute Petitioner's responsive arguments in the Reply, but instead contends that Petitioner's arguments are presented "too late" and that "Petitioner cannot fix the deficiencies of its Petition on Reply." Sur-reply 54. To the extent Patent Owner argues that Petitioner's arguments in the Reply is improper new arguments outside the scope of a proper reply, we disagree. As discussed above, Petitioner's arguments in the Petitioner's Reply on whether FIPA97 teaches the "triggers" recited in the claim are directly responsive to Patent Owner's arguments raised in the Patent Owner Response.

Based on the complete record, we determine that Petitioner has shown sufficiently that FIPA97 teaches "triggers" recited in claim 1.

In sum, based on the complete record, we determine that Petitioner has demonstrated sufficiently that FIPA97 teaches the claimed "expandable, platform-independent, inter-agent language" including "a layer of conversational protocol" and "a content layer," notwithstanding these arguments from Patent Owner.

d. Receiving a Request for Service in an Arbitrarily Complex Goal Expression

The second step of claim 1 recites "receiving a request for service as a base goal in the inter-agent language, in the form of an arbitrarily complex goal expression." Ex. 1001, 29:25–27. Petitioner relies on Kiss to teach the "receiving a request for service" step and combines Kiss's teaching with FIPA97's ACL to teach "a request for service . . . in the form of an arbitrarily complex goal expression." Pet. 43–47.

i. Receiving a Request for Service

Petitioner asserts that Kiss teaches "receiving a request for service" because the reference describes that a "user agent" receives a "query" from a user, and then "parses the user inquiry and directs the parsed inquiry to a metaagent 119 for action." Pet. 44 (citing Ex. 1005, 8:28–34). Petitioner points to the example process depicted in Figures 8–20 of Kiss as showing how a "problem presented by a user is solved through distributed inferencing." *Id.* (citing Ex. 1005, 12:21–22). Petitioner asserts that the initial request illustrated in Figure 8 (not reproduced herein) "when the user asks of the user agent 705 'what is the effect of increasing sales by 20%'? (FIG.8)" is a "base goal" because it is the basic request initiated by the user that inspires a number of additional, more particular requests in order to be satisfied. *Id.* at 44–45 (citing Ex. 1005, 12:23–26, Fig. 8).

ii. Arbitrarily Complex Goal Expression

As discussed above in Section III.B. and the Institution Decision, based on the definitions provided in the '115 patent, we construe "arbitrarily complex goal expression" to mean "a goal expressed in a language or syntax that allows an expression, when appropriate or when desired, that expresses multiple sub-goals and can potentially include more than one type of logical connector (e.g., AND, OR, NOT), and/or more than one level of logical nesting (e.g., use of parentheses), or the substantive equivalent, although not every goal is itself necessarily complex." Inst. Dec. 35–37. Petitioner argues that this definition of "arbitrarily complex goal expression" does not require multiple sub-goals to be expressed within the request, but instead requires only that the goal be expressed in a language "that *allows* the expression of multiple sub-goals . . . ." Pet. 45.

Petitioner asserts that FIPA ACL allows the expression of multiple sub-goals, which can potentially include more than one type of logical connector and/or more than one level of logical nesting (e.g., use of parentheses), or the substantive equivalent, because FIPA97 "allows the construction of s-expressions of arbitrary depth and complexity." *Id.* (citing Ex. 1007, 15). Petitioner argues that FIPA97 also discloses complex "goal expressions" that "express multiple sub-goals" and which may also include "logical nesting" using parentheses. *Id.* at 46 (citing Ex. 1007, 40, 41).

Petitioner contends that, in the combined system of Kiss and FIPA97, the request discussed above— "What is the effect of increasing sales by 20%?"—is an "arbitrary complex goal expression" because it is a goal expressed in FIPA ACL. *Id.*

Patent Owner does not specifically dispute that Kiss teaches this "receiving a request for service" limitation. *See generally* Resp. Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that Kiss teaches "receiving a request for service as a base goal in the inter-agent language, in the form of an arbitrarily complex goal expression," as recited in claim 1.[25]

e. Dynamically Interpreting the Arbitrarily Complex Goal Expression

Claim 1 recites "dynamically interpreting the arbitrarily complex goal expression," the act of interpreting comprising "generating one or more sub-goals expressed in the inter-agent language," "constructing a goal

[25] We also find that Patent Owner has waived any argument directed to this claim limitation. *See* Paper 16, 7.

satisfaction plan," and "dispatching each of the sub-goals to a selected client agent for performance." Ex. 1001, 29:28–44.

Petitioner contends that Kiss teaches "dynamically interpreting the arbitrarily complex goal expression," as recited in claim 1. Pet. 47–49. Petitioner argues

> Kiss discloses that, in response to a request for service, the "meta agent 119 formulates a goal statement for the problem-solving phase of the process, then formulates a solution plan for the problem" and "*dynamically* assesses the problem and its solution states (between users and the knowledge agents 121), divides the problem, and assigns the appropriate knowledge agents 121 to work on the solution."

Id. at 47–48 (emphasis added) (citing Ex. 1005, 8:32–48).

In addition, Petitioner explains how Kiss interprets the exemplary "arbitrary complex goal expression" discussed above—"What is the effect of increasing sales by 20%?"—including the meta agent formulating a plan to respond to the request, identifying other agents and knowledge modules that could assist in the response, and doing both dynamically as additional information is obtained. *Id.* at 48 (citing Ex. 1005, 12:21–14:29, Figs. 8–20). Petitioner further provides a detailed description of how this example goal expression is dynamically interpreted in Kiss. *Id.* at 48–49 (citing Ex. 1005, 12:29–14:30, Figs. 9–11, 13–20).

Patent Owner does not specifically dispute that Kiss teaches this "dynamically interpreting the arbitrarily complex goal expression" limitation. *See generally* Resp. Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has

demonstrated sufficiently that Kiss teaches "dynamically interpreting the arbitrarily complex goal expression," as recited in claim 1.[26]

f. Generating One or More Sub Goals Expressed in the Inter-agent Language

Petitioner contends that Kiss teaches "generating one or more sub-goals expressed in the inter-agent language," as recited in claim 1, because Kiss discloses, in the example "What is the effect of increasing sales by 20%?" discussed above, that the process of responding to the user's request includes several additional requests for service ("sub-goals") to various agents, including two sub-requests each from the sales agent and the meta agent, and three sub-requests from the production agent, where each of the sub-requests is made in FIPA ACL. Pet. 49–50 (citing Ex. 1005, 12:54–56, 13:25–27, 13:37–39, 13:56–57, 14:3–5). According Petitioner, each of these sub-requests is a "sub-goal" because each is a subset of the process of responding to the user's base request—"base goal"—of "what is the effect of increasing sales by 20%?" *Id.* at 50. Petitioner also argues that Kiss's meta-agent is capable of "formulating a sub-problem query." *Id.* (citing Ex. 1005, 11:15–16).

Patent Owner does not specifically dispute that Kiss teaches this "generating one or more sub-goals expressed in the inter-agent language" limitation. *See generally* Resp. Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has

[26] We also find that Patent Owner has waived any argument directed to this claim limitation. *See* Paper 16, 7.

demonstrated sufficiently that Kiss teaches "generating one or more sub-goals expressed in the inter-agent language," as recited in claim 1.[27]

g. Constructing a Goal Satisfaction Plan Including Delegation of Sub-goal Requests

Claim 1 recites "constructing a goal satisfaction plan," the goal satisfaction plan including "a suitable delegation of sub-goal requests" and "dispatching each of the sub-goals to a selected client agent for performance." Ex. 1001, 29:32–43. Petitioner contends that Kiss teaches each of these limitations. Pet. 50–54.

i. Goal Satisfaction Plan

As discussed above in Section III.B.1., we construe the term "a goal satisfaction plan" to mean "a plan for satisfying a goal" for this Final Written Decision.

Petitioner asserts that Kiss teaches "constructing a goal satisfaction plan" because Kiss describes that the meta-agent "formulates a goal statement for the problem-solving phase of the process," then "formulates a solution plan for the problem." Pet. 50 (citing Ex. 1005, 8:33–34, 5:30–64, 12:25–40, Figs. 8–20). Petitioner contends that Figures 8–20 of Kiss illustrate adding tasks to an agenda, i.e., constructing a plan, to satisfy the user request (i.e., a "goal") "what is the effect of increasing sales by 20%?" *Id.* at 50–51 (citing Ex. 1005, 13:27–29, Figs. 8–20).

Patent Owner contends that Kiss does not teach the claim "goal satisfaction plan" because Kiss does not disclose "the use of any reasoning, optimization, or taking into account any advice parameters or constraints."

[27] We also find that Patent Owner has waived any argument directed to this claim limitation. *See* Paper 16, 7.

Resp. 89. Patent Owner also argues that Kiss "does not have the capability of formulating an 'optimal or near-optimal' 'goal satisfaction plan' utilizing reasoning as described in the '115 patent." *Id.* at 91 (citing Ex. 2032 ¶ 141). These arguments are predicated on Patent Owner's proposed construction of "goal satisfaction plan" to mean "a plan for the satisfaction of a complex goal expression in an optimal or near-optimal manner that is consistent with any advice parameters or constraints." *See id.* at 28. As discussed above in Section III.B.1., we disagree with Patent Owner that the claim term "goal satisfaction plan" is limited as Patent Owner contends. Thus, for the reasons explained above in Section III.B.1., we disagree with Patent Owner's argument that Kiss does not disclose the "goal satisfaction plan" recited in claim 1.

Based on the complete record, we determine that Petitioner has shown sufficiently that Kiss teaches "constructing a goal satisfaction plan," as recited in claim 1.

iii. Delegation of Sub-goal Requests Using Reasoning

Claim 1 recites that "the goal satisfaction includes: a suitable delegation of sub-goal requests to best complete the requested service request—by using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms." Ex. 1001, 29:32–39.

(1) Delegation of Sub-goal Requests

Petitioner asserts that Kiss teaches a meta-agent that makes "a suitable delegation of sub-goal requests to best complete the requested service request," as recited in claim 1, because Kiss identifies and queries various

agents (e.g., sales agent, production agent) "who best to respond" to new sub-requests for specific information as they arrive. Pet. 51 (citing Ex. 1005, 12:21–14:30, Figs. 8–20). Petitioner contends that in Kiss, the meta-agent "contains knowledge of problem solving methodologies and distributed inferencing procedures" and is further responsible for allocating "tasks to the knowledge agent layer." *Id.* (citing Ex. 1005, 5:24–27, 3:26–27). Petitioner asserts that Kiss's meta-agent uses these methodologies in conjunction with the agent registry "to dynamically bring available knowledge resources together" ("suitable delegation") by identifying "those other resources capable of furthering the problem-solving process" ("best complete the requested service request"). *Id.* (citing Ex. 1005, 5:27–29).

Patent Owner contends that Kiss does not teach "optimization of any kind." Resp. 89. Patent Owner asserts that Kiss's meta agent employs a trial and error method—it jumps into "executing the solution plan even before the plan is complete" and when errors are encountered, it backtracks or takes a new action. *Id.* at 90–91 (citing Ex. 1005 5:39–46). Patent Owner argues that Kiss is "forced" to go through this trial-and-error process because it does not have the capability of formulating an "optimal or near-optimal" "goal satisfaction plan." *Id.* at 91.

As discussed above in Section III.B., claim 1 does not recite an "optimal or near-optimal" "goal satisfaction plan." Instead, claim 1 recites "a suitable delegation of sub-goal requests to *best complete* the requested service request," which may relate to the "optimal or near-optimal" limiting feature argued by Patent Owner. As discussed in the same section, Patent Owner asserts that the term "optimal" and "near optimal" has a well-established meaning in the context of computer engineering, citing a technical dictionary, which defines "optimization" as "[t]he process of

finding *the best solution* to some problem, where 'best' accords to prestated criteria." Sur-reply 6 (emphasis added) (citing Ex. 2078, 3). Thus, contrary to Patent Owner's argument, the trial and error process of Kiss is a "process of finding *the best solution*" to a problem under Patent Owner's definition of "optimization." *See* Ex. 1005, 5:21–29 ("The meta agent 119 contains knowledge of how to dynamically bring available knowledge resources together as and when needed to provide a response to the inquiry."), 5:32–45 ("The meta agent 119 is responsible for formulating a *dynamic "solution plan"* for the distributed inferencing to be performed by the system 100, and *allocates tasks* to the knowledge agent layer 109 in furtherance of the solution plan. The planning capability of the meta agent 119 includes the ability to formulate parallel *sub-plans* and perform *iterative and recursive procedures*. . . . The meta agent 119 is capable of backtracking or replanning to permit escape during plan execution from dead-end or *otherwise unproductive search paths*." (emphases added)); Pet. 51 (citing Ex. 1005, 5:24–29).

We note that claim 1 does *not* recite "to *best complete* the requested service request *at the very first try*." Thus, Kiss's formulation of a dynamic "solution plan" (and allocation of tasks) that includes "sub-plans" to perform the trial and error process for finding the best solution to a problem satisfies "delegation of sub-goal requests to *best complete* the requested service request," as recited in claim 1.

Patent Owner also argues that it explained during prosecution how the facilitating engine is able to use reasoning to delegate the sub-goals to service providing agents in such a way as "to best complete the requested service request," as follows:

> For example, assume that several agents are able to roast coffee. The facilitating engine is able to use reasoning to delegate the sub-goal task of roasting coffee to the service-providing agent that can roast beans in the least amount of time because the facilitating engine has reasoned that *the least amount of time* taken to make coffee is *the best way* to accomplish the base goal of making coffee.

Resp. 90 (citing Ex. 1002, 173).

In response, Petitioner argues that Kiss similarly optimizes its solution plan based on time. Reply 49–50. Petitioner asserts that Kiss explains that as part of its matchmaking functionality (which is utilized in the solution plan), the agent service layer will create "mappings for each knowledge module 123 relating the capabilities to interests" and that these mappings are used "to optimize problem solutions." *Id.* at 49 (citing Ex. 1005, 7:8–11). According to Petitioner, Kiss describes that when utilizing "real time" inferencing, the meta-agent "may deactivate the knowledge agent whose responses do not meet time delay" or prioritize "knowledge agents that have a history of rapid response or that can tailor their problem solving to real time." *Id.* at 49–50 (citing Ex. 1005, 7:65–84). We agree with Petitioner that Kiss's delegation and prioritization of agents based on their speed of response satisfies "delegation of sub-goal requests to best complete the requested service request," as recited in claim 1.

(2) Using Reasoning

Claim 1 recites that "a suitable delegation of sub-goal requests" is accomplished "by using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms." Petitioner asserts that the '115 patent describes speech recognition, natural

language processing, and email as "domain-independent technologies," and travel planning and reservations agents as "domain specific." Pet. 52 (citing Ex. 1001, 6:51–55).

Citing the testimony of Dr. Lieberman, Petitioner argues that the operations disclosed in Kiss with respect to Figures 8–20 represent "reasoning that includes one or more of domain-independent coordination strategies" because the meta agent, by identifying and querying several different specialized (i.e., domain-specific) agents, is carrying out a strategy that is domain independent (i.e., is not limited to a particular area of knowledge but instead seeks information regarding sales, production, marketing, facilities, and materials) and coordinates the action of those different domain-specific agents across several domains. Pet. 52 (citing Ex. 1003 ¶¶ 331–332). Petitioner argues that Kiss's meta-agent can employ a distributed inferencing scheme that "assembles a problem-specific rule network as a distributed object under control by a meta agent." *Id.* at 52–53 (citing Ex. 1005, 7:21–26). Petitioner contends that application of such a problem-specific set of rules to a request constitutes both "domain-specific reasoning" (because the problem is the domain) and "application-specific reasoning" (because the problem is the application). *Id.* at 53 (citing Ex. 1003 ¶ 333).

As noted above, claim 1 recites that "the goal satisfaction plan includes: a suitable delegation of sub-goal requests to best complete the requested service request—by using reasoning . . . ." In view of this claim language, Kiss's inference process using inferencing schemes may be considered part of a "suitable delegation" which is a recited element of the claimed "goal satisfaction plan."

We additionally note that the portion of Kiss cited by Petitioner describes that distributed inferencing schemes are based on the use of "first-order logic." Ex. 1005, 7:21–23. The same paragraph also describes using a "theorem-proving engine." *Id.* at 7:26–28. We note that both "first-order logic" and "theorem-proving engine" may be considered "domain-independent technologies," similar to speech recognition and natural language processing technologies described in the '115 patent.

Patent Owner contends that the "solution plan" of Kiss is not constructed by "using reasoning" because Kiss's inferencing schemes is used only "[a]fter the solution plan is formulated . . . to perform the search and execution phases." Resp. 89 (citing Ex. 1005, 8:58–60). In response, Petitioner asserts that in the Petition it argued that it would have been obvious to utilize inferencing strategies when constructing the goal satisfaction plan. Reply 48 (citing Pet. 53). Thus, Patent Owner's argument is inapposite because it does not address the combination proposed by Petitioner. *See ClassCo, Inc. v. Apple, Inc.*, 838 F.3d 1214, 1219 (Fed. Cir. 2016) ("*KSR* does not require that a combination only unite old elements without changing their respective functions.").

As Petitioner also persuasively argues, Petitioner in the Petition additionally relies on several other ways in which Kiss utilizes reasoning to construct its solution plan, such as "problem solving methodologies and distributed inferencing procedures," how the meta-agent "assigns the **appropriate** knowledge agents 121 to work on the solution," and how the meta-agent "executes the solution plan by maintaining an agenda, commitment table, task queue, knowledge manager or **equivalent dynamic control service**." Reply 48 (citing Pet. 50–51; Ex. 1003 ¶¶ 322–325, 331–335). Petitioner further argues that Kiss's "iterative and recursive" planning

is another example of how reasoning is used to construct the solution plan of Kiss. *Id.* (citing Pet. 50; Ex. 1003 ¶ 322).

Based on the complete record, we determine that Petitioner has shown sufficiently that Kiss teaches "a suitable delegation of sub-goal requests to best complete the requested service request—by using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms," as recited in claim 1, notwithstanding the arguments by Patent Owner.

h. Dispatching Each of the Sub-goals

Claim 1 recites "dispatching each of the sub-goals to a selected client agent for performance, based on a match between the sub-goal being dispatched and the registered functional capabilities of the selected client agent." Ex. 1001, 29:32–43.

Petitioner asserts that in Kiss

> the meta agent dispatches queries ("*sub-goals*") to various specialized agents based on a determination that the targeted agent possesses a knowledge module appropriate for the query ("*based on a match between the sub-goal being dispatched and the registered functional capabilities of the selected client agent*.")

Pet. 54 (citing Ex. 1005, 12:21–14:29, Figs. 8–20). Petitioner argues that Kiss's specialized agents are not facilitators (and, therefore, are "client agents") because they are not responsible for matching requests, from users and agents, with descriptions of the capabilities of other agents. *Id.* (citing Ex. 1001, 4:64–66, 6:41–43).

Patent Owner does not specifically dispute that Kiss teaches this "dispatching each of the sub-goals" limitation. *See generally* Resp. Based

on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that Kiss teaches "dispatching each of the sub-goals to a selected client agent for performance, based on a match between the sub-goal being dispatched and the registered functional capabilities of the selected client agent," as recited in claim 1.[28]

i. Conclusion as to Claim 1

In consideration of the foregoing and based on the complete record, we are persuaded by Petitioner's arguments and evidence, notwithstanding Patent Owner's arguments, addressed above. Having weighed each of the *Graham* factors, including the scope and content of the prior art, the differences between the prior art and the challenged claim, and the objective evidence of nonobviousness, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 1 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Kiss and FIPA97.

8. Independent Claim 48

Independent claim 48 is directed to an Interagent Communication Language (ICL) providing a basis for facilitated cooperative task completion within a distributed computing environment having a facilitator agent and a plurality of autonomous service-providing electronic agents. Ex. 1001, 34:9–34. Claim 48 reads as follows.

> 48. [(a)] An Interagent Communication Language (ICL) providing a basis for facilitated cooperative task completion within a distributed computing environment having a facilitator agent and a plurality of autonomous service-providing electronic agents, wherein:
> [(b)] the ICL having: a layer of conversational protocol defined by event types and parameter lists associated with one or more of the

[28] We also find that Patent Owner has waived any argument directed to this claim limitation. *See* Paper 16, 7.

> events, wherein the parameter lists further refine the one or more events; and a content layer comprising one or more of goals, triggers and data elements associated with the events;
> [(c)(i)] the ICL having one or more features from a set of features comprising: enabling agents perform queries of other agents;
> [(c)(ii)] enabling agents to exchange information with other [a]gents; and
> [(c)(iii)] enabling agents to set triggers within other agents; and
> [(d)] the ICL having a syntax supporting compound goal expressions
> [(e)] wherein said compound goal expressions are such that goals within a single request provided according to the ICL syntax may be coupled by one or more operators from a set of operators comprising: a conditional execution operator; and a parallel disjunctive operation that indicates that disjunct goals are to be performed by different agents.

Ex. 1001, 29:10–44 (numbering and formatting designated by Petitioner; *see* Pet. Att. C).

a. Preamble

As noted above, the preamble of claim 48 recites "[a]n Interagent Communication Language (ICL) providing a basis for facilitated cooperative task completion within a distributed computing environment having a facilitator agent and a plurality of autonomous service-providing electronic agents."[29]

Petitioner asserts the combined teachings of Kiss and FIPA97 satisfy the recited "Interagent Communication Language (ICL) providing a basis for facilitated cooperative task completion within a distributed computing environment" portion of the preamble for the reasons stated in its Petition at §§ V.C, VI.A.1.a, VI.A.1.b(ii). Pet. 58. These portions of the Petition refer

[29] Because Petitioner shows that the recitations in the preamble are satisfied by Kiss, we need not determine whether the preamble is limiting. *See Vivid Techs.*, 200 F.3d at 803.

to Petitioner's arguments and evidence with respect to: 1) Petitioner's proposed combination of Kiss and FIPA97v1 (*see* Pet. 27–31 (§§ V.C)); 2) the preamble of independent claim 1 (*see* Pet. 32–33 (§§ VI.A.1.a)); and 3) the inter-agent language of claim 1 (*see* Pet. 34–35 (§§ VI.A.1.b(ii)).

Based upon our consideration and analysis of the parties' arguments and evidence presented with respect to these portions of the Petition (*see, e.g.*, §§ II.C.4), as well as our consideration of the parties' arguments and evidence presented with respect to similar claim language recited in independent claim 1 (*see, e.g.*, §§ II.C.6.c), we find that the combined teachings of Kiss and FIPA97 satisfy this portion of the preamble of claim 48.

With respect to the remaining portion of claim 48's preamble, Petitioner asserts Kiss discloses "a facilitator agent and a plurality of autonomous service-providing electronic agents," because Kiss describes a "hierarchical knowledge management system having three general layers: a user interface layer, a meta-agent layer, and a knowledge agent layer." *Id.* (citing Ex. 1005, 3:17–20). Petitioner relies on Kiss' description that "[e]ach layer in the system includes one or more intelligent agents responsible for one portion of the distributed problem-solving inferencing process." Pet. 58–59 (citing Ex. 1005, 3:20–22). Petitioner points out that Kiss describes a meta-agent layer that "analyzes user queries or problem formulations from the user interface layer, allocates tasks to the knowledge agent layer, resolves conflicts arising from the knowledge agent layer, and consolidates (including fusing and deconflicting) results provided by the knowledge agent layer." Pet. 59 (citing Ex. 1005, 3:25–29. Petitioner argues that the "meta agent operates with an agent serviced layer to identify

relevant capabilities of service providing agents in the system." Pet. 59 (citing Ex.1005, 3:36–47, 12:1–14:30).

Petitioner argues that "the agent service layer combined with the meta-agent of Kiss constitutes 'a facilitator agent' because it facilitates cooperation in resolving requests by bi-directionally communicating with knowledge agents and assigning tasks (sub-goals) to them in order to coordinate the cooperative completion of tasks." Pet. 59 (citing Ex. 1005, 12:21–14:30, Figs. 8–20). Petitioner argues that "FIPA97 also discloses a Directory Facilitator ('facilitator agent'), which provides analogous functionality," and argues that "in the combined system" it would "be implemented in the meta agent." Pet. 59 (citing Ex. 1003 ¶¶ 347–351; Ex. 1006, 6–7). Therefore, Petitioner argues, "Kiss discloses a system composed into meta-agents (facilitator agents) and knowledge agents (service-providing agents)." Pet. 59 (citing Ex. 1003 ¶ 570).

Patent Owner argues "*Kiss* and *FIPA97* either alone or in combination **do not** disclose the specialized functionality and operation of the claimed '115 Patent's "facilitator agent.'" Resp. 72. Patent Owner first argues that "The *Kiss* meta-agent is **not** a facilitator." *Id.* Patent Owner argues that "meta-agents are described in the '115 Patent itself as part of the OAA architecture and **distinct** from facilitator agents." *Id.* Patent Owner argues that "[m]eta-agents in the '115 Patent are client agents as opposed to facilitating agents." *Id.* at 73 (citing Ex. 1001, 6:41–45). Patent Owner argues, "[t]he *Kiss* meta-agent is similar to the meta-agent of the '115 Patent, and does not perform the role of the claimed facilitator." *Id.* at 74 (citing Ex. 2032 ¶ 86). Patent Owner asserts that "[t]he *Kiss* meta-agent, at best, is a controller that routes queries through the system and presents results, and it lacks the sophistication and intelligent planning that the

claimed facilitator performs." Resp. 74 (citing Ex. 1001, 19:52–53; Ex. 2032 ¶ 88).

Patent Owner further argues that "[t]he claimed facilitator in the '115 Patent is described as 'preferably involving three types of processing: delegation, optimization, and interpretation.'" Resp. 75 (citing Ex. 1001, 19:2–4). *"Kiss,"* Patent Owner argues, "does not disclose a meta-agent capable of these processes." Resp. 75.

Patent Owner argues:

> First, the Kiss meta-agent, while it breaks down queries into questions and passes them to knowledge agents, does not apply "selective application of global and local constraint and advice parameters onto the specific sub-goals." (Ex. 1001, 19:9–10.) The meta-agent's processing is a simple decomposition, listing of tasks on an agenda, and request for execution of the individual tasks.

Resp. 75 (citing Ex. 2032 ¶ 92).

Second, Patent Owner argues:

> *Kiss* contains no disclosure of optimization— "result[ing] in a goal whose interpretation will require as few exchanges as possible, between the facilitator and the satisfying agents, and can exploit parallel efforts of the satisfying agents." (Ex. 1001, 19:15–18.) There is no mechanism for the meta-agent to consider efficiencies or other factors that would result in returning results in an optimized way. (Ex. 2032 ¶¶ 93–96.) Indeed, the meta-agent simply relies on the agent service layer to tell it which of the agents has the knowledge necessary to answer the question, and then submits to that self-identifying agent.

Resp. 75 (citing Ex. 1005, 12:29–36; Ex. 2032 ¶ 94).

Third, Patent Owner argues:

> *Kiss's* meta-agent does not use an intelligent method or its own knowledge resources to interpret capabilities or use strategies or advice in the coordination of requests to and assembly of results from satisfying agents. (*See* Ex. 1001, 19:24–27 ("facilitator uses

> its knowledge of the capabilities of its client agents" and/or "strategies or advice specified by the requester" when coordinating requests and assembling responses to interpret and satisfy a goal); Ex. 2032 ¶ 96.) While there is some mechanism of deconflicting, there is no disclosure in Kiss that the meta agent does any processing other than applying rule-driven criteria to sort through the results.

Resp. 76 (citing Ex. 2032 ¶ 97). "Indeed," Patent Owner argues, "*Kiss* describes a system that the '115 Patent classifies as the prior art "Distributed Object Approach," depicted in Figure 2 of the patent." Resp. 77 (citing Ex. 2032 ¶ 98).

Patent Owner then goes on to argue that "*FIPA97*'s Directory Facilitator is no more than a directory of agent capabilities." Resp. 78. Patent Owner argues that while FIPA97's Directory Facilitator "may provide agent registry-type functions within a facilitator (*see, e.g.*, Ex. 1001, Fig. 7), *FIPA97* does not disclose any of the robust facilitator functions described in the '115 Patent and which are missing from *Kiss*'s meta-agent." Resp. 78 (citing Ex. 2032 ¶¶ 101–105).

In its Reply, Petitioner argues that Patent Owner "ignores the actual Kiss/FIPA97 combination and instead attacks the references individually." Reply 35. Petitioner also argues "the **combined** system of Kiss/FIPA97 discloses all **the claimed features** of a facilitator agent, so what Kiss chose to name his facilitator [i.e. "meta-agent"] is plainly immaterial." Resp. 36 (internal citations omitted).

Petitioner also argues Patent Owner's "list of the various optional features of the facilitator agent, (Response, 65–71), are simply not relevant to the "*facilitator agent*" as claimed—and in fact, the record evidence suggests a much broader understanding of that term." Reply 36. Petitioner points out that Patent Owner's expert, Dr. Medividovic defined a facilitator

agent as "a specialized server agent responsible for coordinating agent communications and cooperative problem solving." Reply 36 (quoting Ex. 1129, 79:7–9).

Petitioner argues that the "delegation, optimization, and interpretation" functionalities Patent Owner claims are missing from the Kiss meta-agent are limited to a preferred embodiment in the '115 patent, and therefore are not relevant to an obviousness analysis. Reply 37 (citing Resp. 74–75). Petitioner argues that Dr. Medvidovic confirmed these were functionalities of a preferred embodiment. *See* Reply 37 (citing Ex. 1129, 54:2–9). In any event, Petitioner argues, the Kiss/FIPA97 combination teaches delegation under the ordinary meaning of that term. Reply 38 (citing Ex. 1005, 3:25–27, 12:21–14:30, Figs. 8–20, 5:24–27. Petitioner takes similar positions with respect to "optimization" and "interpretation." *See* Reply 38–39 (citing Ex. 1005, 7:8–11, 7:65–8:4, 8:5–8, 8:17–23.

With respect to Patent Owner's criticisms of FIPA97, Petitioner again points out that Patent Owner is arguing against the references separately instead of the combination of FIPA97's Facilitator Agent with Kiss' meta-agent described by Petitioner. Reply 39–40. Petitioner also argues that "FIPA97 does disclose 'facilitation primitives,'" despite Patent Owner's arguments to the contrary. Reply 40.

In its Sur-reply, Patent Owner argues that it is not attacking the prior art references individually, but rather, it "addresses the disclosures within each reference, matching what the Petition does." Sur-reply 36.

With respect to Patent Owner's argument that "[t]he *Kiss* meta-agent is **not** a facilitator (Resp. 72), Patent Owner argues that "**none** of Patent Owner's arguments rest on the fact that the same words are or are not used in the asserted references and the '115 Patent." Sur-reply 37 (citing Reply

36). Patent Owner argues that "Dr. Lieberman, relies on similar portions of the specification to describe his interpretation of the "facilitator agent," as Patent Owner used to show facilitator agent functionality in the '115 patent. Sur-reply 38.

Patent Owner also argues "the Board must disregard [Petitioner's] arguments and evidence" based on any "new citations in Petitioner's Reply" "to the Kiss patent that were not cited in support of the facilitator limitation in the Petition," and that "even if the Board did consider it, the new evidence is not on point." *Id.* at 40.

We agree with Petitioner. "[One] cannot show non-obviousness by attacking references individually where . . . the rejections are based on combinations of references." *Boundary Solns. Inc. v. Corelogic, Inc.*, 711 Fed. Appx. 627, 631–632 (Fed. Cir. 2017) (quoting *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

Petitioner makes clear that it is "the agent service layer [of Kiss] combined with the meta-agent of Kiss [that] constitutes '*a facilitator agent*' because it facilitates cooperation in resolving requests by bi-directionally communicating with knowledge agents and assigning tasks (sub-goals) to them in order to coordinate the cooperative completion of tasks." Pet. 59 (citing Ex. 1005, 12:21–14:30, Figs. 8–20). Petitioner explains that:

> The meta-agent layer "analyzes user queries or problem formulations from the user interface layer, allocates tasks to the knowledge agent layer, resolves conflicts arising from the knowledge agent layer, and consolidates (including fusing and deconflicting) results provided by the knowledge agent layer." Ex. 1005, 3:25–29. The meta agent operates with an agent serviced layer to identify relevant capabilities of service providing agents in the system. Ex. 1005, 3:36–47, 12:1–14:30.

Pet. 59.

Given Petitioner's articulation that it is the *combination* of "the agent service layer [of Kiss] combined with the meta-agent of Kiss [that] constitutes '*a facilitator agent,*" Patent Owner argument that "[t]he *Kiss* meta-agent is **not** a facilitator," is unavailing because it fails to respond to Petitioner's combination of the Kiss agent service layer and the Kiss meta-agent as the recited "facilitator agent." *See* Resp. 72. Similarly, Patent Owner's argument that "[t]he *Kiss* meta-agent is similar to the meta-agent of the '115 Patent, and does not perform the role of the claimed facilitator," is equally unavailing for the same reason. *See id.* at 74.

Patent Owner makes additional arguments in support of its position that the Kiss meta-agent is not a facilitator. For example, Patent Owner argues, "[t]he claimed facilitator in the '115 Patent is described as 'preferably involving three types of processing: delegation, optimization, and interpretation.' (Ex. 1001, 19:2–4.) *Kiss* does not disclose a meta-agent capable of these processes." *See* Resp. 75. In addition to being nonresponsive to Petitioner's proffered combination, these arguments fail for another reason—they improperly attempt to read exemplary characteristics from preferred embodiments in the specification into the claims. Indeed, as this section of the'115 patent makes clear, "[a] further *preferred embodiment of the present invention incorporates* facilitator handling of compound goals, preferably involving *three types of processing: delegation, optimization and interpretation.* Ex. 1001, 19:1–4.

Perhaps more helpful in understanding the nature of a "facilitator agent" is Patent Owner's expert, Dr. Medvidovic's, observation in reference to Figure 4 of the '115 patent that "facilitator agent 402" is "a specialized server agent that is responsible for coordinating agent communications and cooperative problem-solving." *See* Ex. 2032 ¶ 32 (citing Ex. 1001, 6:32–35,

Fig. 4).[30] Indeed, at his deposition, Dr. Medvidovic confirmed that this was his understanding of a "facilitator agent." There, Dr. Medvidovic testified, "if you were asking me define a facilitator agent, I might say it's a specialized server agent responsible for coordinating agent communications and cooperative problem solving. That is a definition." Ex. 1129, 79:15–19.

Based on this understanding of a facilitator agent, Petitioner's proposed combination of "the agent service layer combined with the meta-agent of Kiss constitutes 'a facilitator agent' because it facilitates cooperation in resolving requests by bi-directionally communicating with knowledge agents and assigning tasks (sub-goals) to them in order to coordinate the cooperative completion of tasks," meets the recited "facilitator agent and a plurality of autonomous service-providing electronic agents," because the proposed combination coordinates communications with agents and the cooperative completion of tasks (problem-solving). *See* Pet. 59 (citing Ex. 1005, 12:21–14:30, Figs. 8–20).

b. layer of conversational protocol

Claim 48 also recites, "the ICL having: a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events; and a content layer comprising one or more of goals, triggers and data elements associated with the events." Petitioner argues the combination of Kiss and FIPA97 satisfies this limitation for the reasons stated in the Petition with respect to claim 1 at §§ VI.A.1.b(ii) (Pet. 34–35), VI.A.1.c (Pet. 35–41), and VI.A.1.d (Pet. 42–43). Pet. 60.

---

[30] We note for the record that neither party proposed a construction for the term, "facilitator agent."

The recitation of these limitations in claim 48 relating to a layer of conversational protocol defined by event types and parameter lists, a content layer, goals, triggers, and data elements are virtually identical to those recited in claim 1. *See* Ex. 1001, 29:18–24. For the same reasons set forth, *supra*, with respect to our analysis of claim 1's limitations in Section II.C.7.c.iii and iv, we determine that Petitioner has shown sufficiently that the combination of Kiss/FIPA97 teaches an "ICL having: a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events; and a content layer comprising one or more of goals, triggers and data elements associated with the events" as recited in claim 48.

c. ICL Features

Claim 48 also recites, "the ICL having one or more features from a set of features comprising: enabling agents perform [sic] queries of other agents; enabling agents to exchange information with other agents; and enabling agents to set triggers within other agents." *Id.*

i. Agent Queries

Petitioner argues the agents in Kiss are able to "perform queries of other agents" using each agent's "inter-agent abstract communications facilities." Pet. 60 (citing Ex. 1005, 3:34–36). Petitioner argues Kiss teaches that the "abstract communication facilities" ("ICL") allows agent's to "negotiate with each other, conduct joint planning, and to collaborate in the execution of planned tasks." Pet. 60 (citing Ex. 1005, 3:34–36). Petitioner argues a Skilled Artisan would understand that to conduct joint planning and negotiate agents must be able to "perform queries of other agents." Pet. 60. Petitioner also argues that Kiss' agents can communicate through the agent service layer that facilitates "agent-to-agent interaction."

Id. (citing Ex. 1005, 7:13). Petitioner argues that "[i]n a system designed to facilitate query processing and task completion amongst agents, this 'agent-to-agent interaction' must necessarily include the ability to '*perform queries of other agents.'*" Pet. 60 (citing Ex. 1003 ¶ 580).

Petitioner also argues Kiss teaches a meta-agent who "analyzes user queries" and "allocates tasks" to knowledge agents. Pet. 61 (citing Ex. 1005, 3:25–30. Petitioner argues a "Skilled Artisan would understand that allocating tasks in a knowledge management system is analogous to 'queries of other agents.'" *Id.* (citing Ex. 1003 ¶ 581). Petitioner further argues "the example of Figures 8 through 20 of Kiss shows the meta agent both sending queries to and receiving queries from the sales agent and the production agent." Pet. 61 (citing Ex. 1005, 12:21–14:29, Figs. 8–20; Ex. 1003 ¶ 581).

ii. Information Exchange

Petitioner argues the agents in Kiss are able to "exchange information with other agents" using each agent's "inter-agent abstract communications facilities." Pet. 61 (citing Ex. 1005, 3:34–36). Petitioner relies on Figures 7–20 in Kiss that teach agents who "exchange information" with other agents. Pet. 61 (citing Ex. 1005, Figs. 7–20; Ex. 1003 ¶ 583).

Petitioner argues a Skilled Artisan would understand that each communication utilizes the agent's "inter-agent abstract communications facilities." Pet. 62 (citing Ex. 1005, 3:34–36). Petitioner also argues a Skilled Artisan would understand that in a "knowledge management system" the communication protocol between agents must be able to facilitate the ability to "exchange information." Pet. 62 (citing Ex. 1003 ¶ 584).

iii. Triggers

Petitioner asserts FIPA97 teaches the use of content parameters to "set triggers within other agents." Pet. 62. Petitioner argues FIPA97 teaches a performative accept-proposal; this performative, Petitioner argues, "informs the receiver" that the "receiving agent" ("other agent") should "perform the action," (i.e., action that takes place in response) once a "given precondition is, or becomes, true" (i.e., occurrence or failure of a precondition). Pet. 62–63 (citing Ex. 1007, 23). Therefore, Petitioner argues, the "precondition" is sent to an agent through the content layer, then at some future point, when that "precondition" is met the receiving agent will trigger and take an action based upon the information encoded in the content layer of the message. Pet. 63 (citing Ex. 1007, 23). In this way, Petitioner argues, "the content layer and the content parameter can be used to '*set triggers within other agents*.'" *Id.*

Patent Owner does not specifically dispute many Petitioner's arguments and evidence provided with respect to claim 48 that the combination of Kiss/FIPA97 teaches an "ICL having one or more features from a set of features comprising: enabling agents perform [sic] queries of other agents; enabling agents to exchange information with other agents; and enabling agents to set triggers within other agents." *See generally* Resp. To the extent that Patent Owner did not respond to Petitioner's arguments and evidence with respect to this claim limitation, we find that Patent Owner has waived any such argument. *See* paper 17, 7. To the extent that Patent Owner responded to Petitioner's arguments and evidence concerning "triggers" as recited in claim 1, we refer to our analysis, *supra*, of the parties' arguments and evidence in Section II.C.7.c.iv.

Based on the complete record and for the reasons explained by Petitioner with respect to this limitation in claim 48 and for the reasons set forth, *supra*, with respect to our analysis of similar limitations in claim 1, we are persuaded that Petitioner has demonstrated sufficiently that the combined teaching of Kiss/FIPA97 teach the recited limitation of claim 48.

d. Compound Goal Expression

Claim 48 also recites, "the ICL having a syntax supporting compound goal expressions." Petitioner asserts the combined teachings of Kiss and FIPA97 satisfy this claim limitation for the reasons it stated in the Petition at § VI.A.1.e(ii) (Pet. 45–47), concerning claim 1's recitation of the limitation "*arbitrarily complex goal expression*." *See* Pet. 63.

Patent Owner does not specifically provide any arguments or evidence directed to this limitation of claim 48. *See generally* Resp. To the extent Patent Owner did not respond to Petitioner's arguments and evidence with respect to this limitation of claim 48, we find that Patent Owner has waived any such argument. *See* paper 17, 7.

With respect to the parties' arguments and evidence provided for claim 1's recitation of an "*arbitrarily complex goal expression*," we refer to our analysis, *supra,* in Section II.C.7.d and e. Based on the complete record and for the reasons set forth, *supra,* with respect to our analysis of a similar limitation in claim 1, we are persuaded that Petitioner has demonstrated sufficiently that the combined teachings of Kiss/FIPA97 meet the recited limitation of claim 48.

e. Syntax Operators

Claim 48 also recites, "wherein said compound goal expressions are such that goals within a single request provided according to the ICL syntax

may be coupled by one or more operators from a set of operators comprising: a conditional execution operator; and a parallel disjunctive operation that indicates that disjunct goals are to be performed by different agents."

i. Sub-goals separated by operators

Petitioner asserts the combined teachings of Kiss and FIPA97 satisfy the recited "wherein said compound goal expressions are such that goals within a single request provided according to the ICL syntax may be coupled by one or more operators" for the reasons stated in the Petition at § VI.A.1.e(ii) (Pet. 45–47). Pet. 63.

Petitioner also argues it would have been obvious to include a base goal that is a compound goal having sub-goals separated by operators in the system of Kiss and FIPA97 based on the teachings of FIPA97, and, alternatively, on the teachings of Kiss. *Id.* at 63–64 (citing Ex. 1003 ¶¶ 166, 286–287, 341–344, 479).

ii. A conditional execution operator

Petitioner argues the teachings of Kiss and FIPA97 disclose that operators can include "a conditional execution operator." Pet. 64. Petitioner point out that FIPA97 explains that the performative "request-when" can be used as a "conditional execution operator." *Id.* (citing Ex. 1003 ¶ 486). Petitioner also points to FIPA97's explanation that request-when takes an action "when some given proposition becomes true." *Id.* Therefore, Petitioner argues, a performative ("operator") indicates that an action should be taken when a conditional test becomes true ("task is executed if a given condition is true"). *Id.*

iii. A parallel disjunctive operation

Petitioner asserts the teachings of Kiss and FIPA97 also show that operators can include a "parallel disjuncti[ve] operator" in the form of an operator that is able to query multiple disjunct agents in a single expression. Pet. 65. Petitioner asserts FIPA97's disclosed content language (SL2) supports grammars for "quantifying-in inside modal operators." *Id.* (citing Ex. 1007, 78).

Patent Owner does not specifically provide any arguments or evidence directed to the syntax operator limitations of claim 48. *See generally* Resp. To the extent Patent Owner did not respond to Petitioner's arguments and evidence with respect to this limitation of claim 48, we find that Patent Owner has waived any such arguments. *See* paper 17, 7.

With respect to the parties' arguments and evidence provided for claim 1's recitation of an "*arbitrarily complex goal expression*," we refer to our analysis, *supra,* in Section II.C.7.d and e. Based on the complete record and for the reasons explained by Petitioner with respect to these limitations in claim 48, and for the reasons we set forth, *supra,* with respect to our analysis of similar limitations in claim 1, we are persuaded that Petitioner has demonstrated sufficiently that the combined teachings of Kiss/FIPA97 meet the recited limitation of claim 48 "wherein said compound goal expressions are such that goals within a single request provided according to the ICL syntax may be coupled by one or more operators from a set of operators comprising: a conditional execution operator; and a parallel disjunctive operation that indicates that disjunct goals are to be performed by different agents."

f. Conclusion as to Claim 48

In consideration of the foregoing and based on the complete record, we are persuaded by Petitioner's arguments and evidence, notwithstanding Patent Owner's arguments, addressed above. Having weighed each of the *Graham* factors, including the scope and content of the prior art, the differences between the prior art and the challenged claim, and the objective evidence of nonobviousness, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 48 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Kiss and FIPA97.

9. Dependent Claims 2, 3, 11, and 49–60

Petitioner argues the combination of Kiss and FIPA97 teaches or suggests the recited limitations of dependent claims 2, 3, 11, and 49–60. Pet. 54–85.

a. Claim 2

Claim 2 recites, "[a] computer-implemented method as recited in claim 1, further including the following acts of: receiving a new request for service as a base goal using the inter-agent language, in the form of another arbitrarily complex goal expression, from at least one of the selected client agents in response to the sub-goal dispatched to said agent; and recursively applying the step of dynamically interpreting the arbitrarily complex goal expression in order to perform the new request for service."

Petitioner argues that Kiss/FIPA97 satisfies the "receiving a request" limitation of claim 2 because:

> [t]he meta-agent in Kiss dispatches a sub-request ("*sub-goal*") to the Production Agent ("*at least one of the selected client agents"*) requesting confirmation of the cost per-unit of a specified number of units. Ex. 1005, 13:22-35, Figs. 8–20. In

> response, the meta-agent receives from the Production Agent a request to "identify the cost of a sufficient number of production lines to produce the specified number of units," Ex. 1005, 13:36–39, which is both a *new request for service"*—it had not been previously received by the meta-agent—and a "*base goal"*—it is a basic request needed by the Production Agent to perform its task. The request is "*using the inter-agent language in the form of another arbitrarily complex goal expression"* because, as demonstrated above, all communications between agents in the Kiss/FIPA97 are made using the FIPA ACL, and a request in the FIPA ACL satisfies the inventors' express definition of "*arbitrarily complex goal expression."*

Pet. 55 (citing *id.* § VI.A.1.e(ii); Ex. 1003 ¶ 340).

Petitioner also argues that Kiss/FIPA97 satisfies the "recursively interpreting the goal expression" limitation of claim 2 because:

> [i]n responding to the Production Agent requested noted above, the meta-agent receives two additional requests (*i.e.*, cost of materials and labor), each relating to the original sub-request sent to the Production Agent. Ex. 1005, 13:56–58, 14:3–5. In responding to those additional requests, the meta-agent is "*recursively . . . dynamically interpreting"* Production Agent request by determining the appropriate agent to respond, placing the task on the agenda, and issuing another sub-request.

Pet. 55–56 (citing Ex. 1005, 5:33–39; Ex. 1003 ¶ 342).

Petitioner further argues that for the reasons set forth in its Petition at Section VI.A.1.e(ii), it would have been obvious for the Production Agent to combine its three sub-requests into a single request because it needed the three types of requested information and because FIPA ACL permits such compound service requests. Pet. 56 (citing Ex. 1003 ¶¶ 343–345).

Patent Owner does not respond specifically to Petitioner's evidence and arguments presented with respect to claim 2. *See, e.g.*, Resp. 65–119.[31] Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that the proffered combination of Kiss/FIPA97 teaches or suggests "a computer-implemented method as recited in claim 1, further including the following acts of: receiving a new request for service as a base goal using the inter-agent language, in the form of another arbitrarily complex goal expression, from at least one of the selected client agents in response to the sub-goal dispatched to said agent; and recursively applying the step of dynamically interpreting the arbitrarily complex goal expression in order to perform the new request for service," as recited in claim 2.

b. Claim 3

Claim 3 recites, "[a] computer-implemented method as recited in claim 2 wherein the act of registering a specific agent further includes: invoking the specific agent in order to activate the specific agent; instantiating an instance of the specific agent; and transmitting the new agent profile from the specific agent to a facilitator agent in response to the instantiation of the specific agent."

Petitioner argues:

> FIPA97 discloses the initiation of the creation of an agent to play a specific role in the system ("*invoking the specific agent in order to activate the specific agent"*), a responsibility of the Agent Management System and part of the registration process. Ex. 1006, 2, 7, 11, 17, Fig. 3. That functionality results in the

[31] To the extent Patent Owner has not responded to Petitioner's arguments and evidence with respect to this claim limitation, we find that Patent Owner has waived any such argument. *See* paper 17, 7.

> activation of a new agent ("*instantiating an instance of the specific agent"*). Ex. 1006, 16, 17, 18, Fig. 3. Moreover, in the combined system, the details concerning the interests and capabilities of that new agent ("*new agent profile from the specific* agent") are provided ("*transmitting"*) to the agent service layer, which combined with the meta-agent of Kiss constitutes "*a facilitator agent"* because it is responsible for matching requests, from users and agents, with descriptions of the capabilities of other agents, (Ex. 1001, 4:64–66). Ex. 1005, 12:21–14:30, Figs. 8–20. FIPA97 also discloses a Directory Facilitator ("*facilitator agent"*), which provides analogous functionality, Ex. 1006, 6–7, and for that reason would in the combined system be implemented in the meta agent.

Pet. 56–57 (citing Ex. 1003 ¶ ¶ 217–219, 348.

Petitioner also argues,

> it would have been obvious to include this claim element in the combined system. Ex. 1003 ¶ 349. It would have been obvious to include, as part of the registration process, a process that initiates the creation of an agent to play a specific role in the system ("*invoking the specific agent in order to activate the specific agent*") because a Skilled Artisan would have understood that new agents would at times have to be added to the system, so she would have been motivated to include a process for doing so. Indeed, the Production Agent of Kiss would necessarily have to be created by the system before it could provide the functionality described in Kiss. Initiating that creation process would be obvious from the disclosures of Kiss and FIPA97 because it was a necessary prerequisite to providing the described functionality of the Production Agent.

Pet. 57 (citing Ex. 1003 ¶ 350).

Patent Owner does not respond specifically to Petitioner's evidence and arguments presented with respect to claim 3. *See, e.g.*, Resp. 65–119. To the extent Patent Owner has not responded to Petitioner's arguments and evidence with respect to this claim limitation, we find that Patent Owner has waived any such argument. *See* paper 17, 7.

Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that the proffered combination of Kiss/FIPA97 teaches or suggests "[a] computer-implemented method as recited in claim 2 wherein the act of registering a specific agent further includes: invoking the specific agent in order to activate the specific agent; instantiating an instance of the specific agent; and transmitting the new agent profile from the specific agent to a facilitator agent in response to the instantiation of the specific agent," as recited in claim 3.

c. Claim 11

Claim 11 recites, "[a] computer-implemented method as recited in claim 1 further comprising the act of establishing communication between the plurality of distributed agents."

Petitioner argues, "Kiss discloses "*establishing communication between the plurality of distributed agents"* through the use of "**inter-agent abstract communications facilities***"* which allow agents to "negotiate with each other, conduct joint planning, and to collaborate in the execution of planned tasks." Ex. 1005, 3:32–36. The system in Kiss facilitates "agent-to-agent interaction."

Pet. 58 (citing Ex. 1005, 7:13, 12:21–14:33; Figs. 8–21; Ex. 1003 ¶¶ 385, 386).

Patent Owner does not respond specifically to Petitioner's evidence and arguments presented with respect to claim 11. *See, e.g.*, Resp. 65–119. To the extent Patent Owner has not responded to Petitioner's arguments and evidence with respect to this claim limitation, we find that Patent Owner has waived any such argument. *See* paper 17, 7.

Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that the proffered combination of Kiss/FIPA97 teaches or suggests "[a] computer-implemented method as recited in claim 1 further comprising the act of establishing communication between the plurality of distributed agents," as recited in claim 11.

d. Claims 51, 52

Claim 51 recites, "[a]n ICL as recited in claim 48 wherein the ICL syntax supports explicit task completion constraints include use of specific agent constraints and response time constraints."

Claim 52 recites, "[a]n ICL as recited in claim 51, wherein possible types of task completion constraints include use of specific agent constraints and response time constraints."

Petitioner argues that:

> [i]n Kiss, when using the "Real Time" inferencing method the user may specify "I am willing to wait ten minutes for a response," at which point the meta-agent may "deactivate" any knowledge agents who "do not meet time delay." Ex. 1005, 7:65–8:2. Because these "*constraints"* effect how the inferencing process is carried out and can result in "partial information from the incomplete knowledge agent," Ex. 1005, 8:1–2, they are "*task completion constraints."*

Pet. 68–69 (citing Ex. 1003 ¶ 517).

Petitioner argues that:

> Kiss also discloses the use of "*specific agent constraints*." Partitioned inferencing, which is a type of constraint on task completion, is used where the "problem domain is easily divided into distinct subfields," in this case the meta-agent should have the "available subfield and query division possibilities." Ex. 1005, 7:53–58. Therefore, the meta-agent could divide the

> problem based upon specific agent constraints such as the subfields and problem domain.

Pet. 69 (citing Ex. 1003 ¶ 603).

> Petitioner argues:
>
> Kiss further discloses "*response time constraints"* in the inferencing method called "Real Time." When using the "Real Time" inferencing, which is a type of constraint on task completion, method the user may specify, "I am willing to wait ten minutes for a response," at which point the meta-agent may "deactivate" any knowledge agents who "do not meet time delay."

Pet. 69 (citing Ex. 1005, 7:65–8:2; Ex. 1003 ¶¶ 604, 605).

> In the alternative, Petitioner argues:
>
> FIPA97 also discloses "task completion constraints." FIPA97 discloses the use of the performative "request-when," which causes an agent to "inform" another agent that a certain action should be performed "as soon as a given precondition, expressed as a proposition, becomes true." Ex. 1007, 40; Ex. 1003 ¶ 518. Therefore, FIPA97 disclose a performative which applies an *"explicit . . . constraint"* (wait until alarm) on "task completion" (before completing the action in the performative).

Pet. 69–70 (citing Ex. 1003 ¶¶ 519–520).

> Petitioner argues that:
>
> FIPA97 also discloses "*specific agent constraints*," such as the "Quality of Service" parameter, which is a type of constraint on task completion that allows the user to specify which networks can be used in a VPN connection, such as "Constant Bit Rate (CBR) traffic for voice ATM network." Ex. 1012, 46. Therefore, FIPA ACL supports constraints based on the functional capabilities of specific agents.

Pet. 70 (citing Ex. 1003 ¶¶ 600–601).

> Petitioner argues:
>
> FIPA97 also discloses *"response time constraints"* in the form of "Response Time," which is a type of constraint on task

> completion, as a negotiation metric between agents. Ex. 1012, 30. FIPA97 describes how FIPA ACL can support response time based conditions through the specification of a special parameter "respond-by" which "[d]enotes a time interval or event(s) when a response to a request is desired."

Pet. 70 (citing Ex. 1012, 47; Ex. 1003 ¶ 602).

Patent Owner does not respond specifically to Petitioner's evidence and arguments presented with respect to claims 51 and 52. *See, e.g.*, Resp. 65–119. To the extent Patent Owner has not responded to Petitioner's arguments and evidence with respect to this claim limitation, we find that Patent Owner has waived any such argument. *See* paper 17, 7.

Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that the proffered combination of Kiss/FIPA97 teaches or suggests "[a]n ICL as recited in claim 48 wherein the ICL syntax supports explicit task completion constraints include use of specific agent constraints and response time constraints," and "[a]n ICL as recited in claim 51, wherein possible types of task completion constraints include use of specific agent constraints and response time constraints," as recited in claims 51 and 52, respectively.

e. Claims 53, 54

Claim 53 recites, "[a]n ICL as recited in claim 51 wherein the ICL syntax supports explicit task completion advisory suggestions within goal expressions."

Claim 54 recites, "[a]n ICL as recited in claim 48 wherein the ICL syntax supports explicit task completion advisory suggestions within goal expressions."

Petitioner argues, "FIPA97 discloses 'Advice Parameters' in the form of searches within the 'Directory Facilitator.' Agents may use the directory

performative 'search' to search local or remote directories for relevant resources." Pet. 71 (citing Ex. 1006, 20; Ex. 1003 ¶ 610). Petitioner argues "FIPA97 discloses two possible 'constraints;' Directory Facilitator Depth ('df-depth') and Required Number of Records ('recs-req')." Pet 71 (citing Ex. 1006, 21–22). "The Directory Facilitator Depth constraint," Petitioner argues, "is similar to the level_limit 'Advice Parameter' disclosed in the '115 Patent; both define how many directory facilitators should be searched to locate specific agents." Pet. 71–72 (citing Ex. 1006, 21–22).

Patent Owner does not respond specifically to Petitioner's evidence and arguments presented with respect to claims 53 and 54. *See, e.g.*, Resp. 65–119. To the extent Patent Owner has not responded to Petitioner's arguments and evidence with respect to this claim limitation, we find that Patent Owner has waived any such argument. *See* paper 17, 7.

Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that the proffered combination of Kiss/FIPA97 teaches or suggests "[a]n ICL as recited in claim 51 wherein the ICL syntax supports explicit task completion advisory suggestions within goal expressions," and "[a]n ICL as recited in claim 48 wherein the ICL syntax supports explicit task completion advisory suggestions within goal expressions," as recited in claims 53 and 54, respectively.

f. Claim 55

Claim 55 recites, "[a]n ICL as recited in claim 48 wherein each autonomous service-providing electronic agent defines and publishes a set of capability declarations or solvables, expressed in ICL, that describes services provided by such electronic agent."

Petitioner argues that "Kiss discloses a published set of "capability declarations or solvables" by "maintaining a registry of agents in the system," Ex. 1005, 3:37–38, such as the agent registry." Pet. 72 (citing Ex. 1005, 3:40–43, 12:1–17; Ex. 1003 ¶ 618).

Petitioner argues:

> [t]he registry "identifies each agent's capabilities and interests, and contains knowledge about the relationships between them," Ex. 1005, 3:40–43. ("each autonomous service-providing electronic agent" / "set of capability declarations or solvables"). Further, Kiss discloses that each agent is responsible for defining and publishing these "capability declarations or solvables." Kiss explains that each knowledge module is associated with a knowledge agent; in a one-to-one or many-to-one configuration. Ex. 1005, 6:39–45. Further, each knowledge agents keeps "summaries" ("solvables") of the "domain features and methods," ("set of capability declarations"/ "services") of its associated knowledge modules, therefore the Knowledge Agent "defines . . . a set of capability declarations or solvables."

Pet. 73 (citing Ex. 1005, 6:46–48).

Petitioner also argues, "'the capabilities, interests, and attributes' ('set of capability declarations') for each module is registered ('publishes') in the agent service layer by its associated agent. Ex. 1005, 6:48–51. Thus, each associated Knowledge agent 'defines and publishes a set of capability declarations or solvables.'" Pet. 73–74 (citing Ex. 1003 ¶ 619).

In the alternative, Petitioner argues, "[a]lternatively, FIPA97 discloses a 'Directory Facilitator' (DF) which provides 'yellow pages' services to other agents. ('a set of capability declarations or solvables, . . . that describes services provided by such electronic agent.'). Ex. 1006, 6 ('Agents may register their services with the DF or query the DF to find out what services are offered by which agents.')." Pet. 74 (citing Ex. 1003 ¶ 621).

Patent Owner does not respond specifically to Petitioner's evidence and arguments presented with respect to claim 55. *See, e.g.*, Resp. 65–119. To the extent Patent Owner has not responded to Petitioner's arguments and evidence with respect to this claim limitation, we find that Patent Owner has waived any such argument. *See* paper 17, 7.

Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that the proffered combination of Kiss/FIPA97 teaches or suggests "[a]n ICL as recited in claim 48 wherein each autonomous service-providing electronic agent defines and publishes a set of capability declarations or solvables, expressed in ICL, that describes services provided by such electronic agent," as recited in claim 55.

g. Claim 56

Claim 56 recites, "[a]n ICL as recited in claim 55 wherein an electronic agent's solvables define an interface for the electronic agent."

Petitioner argues, "FIPA97 further discloses that the solvable may 'define an interface.' FIPA97 discloses various interface parameters ('define an interface') which are included in the initial agent registration process ('solvables'). As part of registration each agent provides information on the conditions and ontologies it accepts when processing a request." Pet. 76 (citing Ex. 1006, 35; Ex. 1003 ¶ 626). Petitioner also argues, "these parameters can define the language and syntax of communication between the two agents ("interface for the electronic agent.") and the conditions that must be meet when processing a service request." Pet. 77 (citing Ex. 1003 ¶ 627).

Patent Owner does not respond specifically to Petitioner's evidence and arguments presented with respect to claim 56. *See, e.g.*, Resp. 65–119.

To the extent Patent Owner has not responded to Petitioner's arguments and evidence with respect to this claim limitation, we find that Patent Owner has waived any such argument. *See* paper 17, 7.

Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that the proffered combination of Kiss/FIPA97 teaches or suggests "[a]n ICL as recited in claim 55 wherein an electronic agent's solvables define an interface for the electronic agent," as recited in claim 56.

h. Claim 57

Claim 57 recites, "[a]n ICL as recited in claim 56 wherein the facilitator agent maintains an agent registry making available plurality of electronic agent interfaces."

Petitioner argues, "[e]ach agent in the system must register with a directory facilitator agent. As part of this registration, the agent provides a listing of its available 'agent-services' ('agent interfaces'). Each of the 'agent-services' are part of the agent's registration and are stored within the agent registry." Pet. 78 (citing Ex. 1003 ¶ 630).

"Therefore," Petitioner argues, "the Directory Facilitator agent ('the facilitator agent') manages and stores each agent's registration including each agent's services ('interface') within the agent registry ('maintains an agent registry'). In the combined system, the Directory Facilitator would be implemented in the meta agent of Kiss." Pet. 79 (citing Ex. 1003 ¶¶ 348–351,631.

Patent Owner does not respond specifically to Petitioner's evidence and arguments presented with respect to claim 57. *See, e.g.*, Resp. 65–119. To the extent Patent Owner has not responded to Petitioner's arguments and

evidence with respect to this claim limitation, we find that Patent Owner has waived any such argument. *See* paper 17, 7.

Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that the proffered combination of Kiss/FIPA97 teaches or suggests "[a]n ICL as recited in claim 56 wherein the facilitator agent maintains an agent registry making available plurality of electronic agent interfaces," as recited in claim 57.

i. Claim 58

Claim 58 recites, "[a]n ICL as recited in claim 57 wherein the possible types of solvables includes procedure solvables, a procedure solvable operable to implement a procedure such as a test or an action."

Petitioner argues, "FIPA97 discloses a 'solvable' in the form of an agent registration parameter that defines a test or action. As part of agent registration, agent can provide a listing of their available 'agent-services' including a 'service-type' for each service that the agent provides." Pet. 81 (citing Ex. 1006, 20; Ex. 1003 ¶ 636).

Petitioner argues, "the 'service-type' is used to '[d]enote[] the unique service type' (i.e., the actions the agent can take) on offer by the agent. Ex. 1006, 35. Therefore, the 'service-type' parameter represents a 'solvable' that characterizes an action or test that is performed by the agent, and is thus a 'procedure solvable.'" Pet. 82 (citing Ex. 1003 ¶ 638).

Patent Owner does not respond specifically to Petitioner's evidence and arguments presented with respect to claim 58. *See, e.g.*, Resp. 65–119. To the extent Patent Owner has not responded to Petitioner's arguments and evidence with respect to this claim limitation, we find that Patent Owner has waived any such argument. *See* paper 17, 7.

Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that the proffered combination of Kiss/FIPA97 teaches or suggests "[a]n ICL as recited in claim 57 wherein the possible types of solvables includes procedure solvables, a procedure solvable operable to implement a procedure such as a test or an action," as recited in claim 58.

j. Claims 59, 60

Claim 59 recites, "[a]n ICL as recited in claim 58 wherein the possible types of solvables further includes data solvables, a data solvable operable to provide access to a collection of data."

Claim 60 recites, "[a]n ICL as recited in claim 58 wherein the possible types of solvables further includes data solvables, a data solvable operable to provide access to a collection of data."

Petitioner argues, "FIPA97 discloses a WRAPPER agent ontology that can be used to define and provide access to a data source. A wrapper agent is used to integrate non-agent software, databases, and systems into a community of agents by creating an agent that translates between the agents and the non-agent software." Pet. 82–83 (citing Ex. 1008, 5–6; Ex. 1003 ¶ 641. Petitioner argues, "a wrapper agent can be used to connect a data source into the community of agent by translating between the data query language of the data source and the agent communication language. Pet. 83 (citing Ex. 1008, 6; Ex. 1003 ¶ 642). Petitioner argues, "[b]y registering this functionality with the directory facilitator, the wrapper agent 'will allow client agents to invoke commands on the underlying software system, translating the commands contained in ACL messages into operations on the underlying software system.'" Pet. 84 (citing Ex. 1008, 9; Ex. 1003 ¶ 643). "Therefore," Petitioner argues, "when a wrapper agent registers with the

directory facilitator it will discloses that it provides access to a data source through this 'service-type' parameter ('data solvable')." Pet. 85 (citing Ex. 1003 ¶ 644).

Patent Owner does not respond specifically to Petitioner's evidence and arguments presented with respect to claims 59 and 60. *See, e.g.*, Resp. 65–119. To the extent Patent Owner has not responded to Petitioner's arguments and evidence with respect to this claim limitation, we find that Patent Owner has waived any such argument. *See* paper 17, 7.

Based on the complete record and for the reasons explained by Petitioner, we are persuaded that Petitioner has demonstrated sufficiently that the proffered combination of Kiss/FIPA97 teaches or suggests "[a]n ICL as recited in claim 58 wherein the possible types of solvables further includes data solvables, a data solvable operable to provide access to a collection of data," and "[a]n ICL as recited in claim 58 wherein the possible types of solvables further includes data solvables, a data solvable operable to provide access to a collection of data," as recited in claims 59 and 60, respectively.

D. Motion to Exclude

Patent Owner filed a Motion to Exclude (Paper 35, "Motion") certain "a portion of Exhibit 1129, as well as related testimony relied on by [Petitioner]." Paper 35, 1. Exhibit 1129 is the deposition transcript of Patent Owner's expert Dr. Medvidovic, taken on May 19, 2020. Patent Owner seeks to exclude Petitioner's reliance "on portions of Dr. Medvidovic's deposition testimony that should be excluded because the question on which the testimony is based is vague, ambiguous, confusing,

lacks foundation and calls for a legal conclusion. And any testimony elicited from this improper question is irrelevant, prejudicial, and misleading." *Id.*

In particular, Patent Owner seeks to exclude lines 53:19–54:21 of Exhibit 1129, which reads as follows:

> Q: If that's true, then it's your opinion these three things, these three types of processing are required to teach '115's facilitator, correct?
>
> MS. ABDULLAH: Objection.
>
> BY THE WITNESS:
>
> A: I think that the authors of the patent, the inventors were very careful to specify that this is is an embodiment. It's a preferred embodiment. There are other embodiments that they discuss. For this particular embodiment that deals with compound goals, delegation, optimization and interpretation are preferably involved. So this is the preferred embodiment. This is a legal thing, not a technical thing. What a preferred embodiment is, that's something that appears in patents, pretty much every patent I've ever read, software patent, anyway. It is something that has a particular meaning. So if you want to handle compound goals, you need to have three types of processing preferably, delegation, optimization and interpretation. So it is my opinion that anybody who tries or, sorry, anybody who is claiming, purporting to be solving the same kinds of problems needs to show an embodiment that matches those three.

Ex. 1129, 53:19–54:21.

Patent Owner argues that Petitioner "attempts to use this improper testimony to support its incorrect conclusion that 'delegation, optimization, and interpretation' are 'functionalities [] limited to a preferred embodiment, (EX1001, 19:1-4), so they are not relevant to the claims.' Paper 35, 3 (citing Reply 37). Patent Owner argues that Petitioner's "Microsoft's "question was vague, ambiguous, confusing, lacked foundation and called for a legal

conclusion." Paper 35, 3–4. Patent Owner also argues "the testimony is irrelevant, prejudicial, and misleading. *Id.* at 4.

Petitioner opposes the motion (Paper 36), arguing that the testimony is admissible and that Petitioner's counsel "failed to object to this question with sufficient specificity at the appropriate time." Paper 36, 1 (citing PTAB Consolidated Trial Practice Guide, pg. 128 (November 2019) ("An objection must be stated concisely in a non-argumentative and non-suggestive manner."). Petitioner points out that Patent Owner's counsel "only said 'Objection' but failed to indicate what type of objection—i.e., form, relevance, etc." Paper 36, 1. Petitioner argues that for the first time, Patent Owner "now attempts to assert multiple grounds for exclusion which were not previously raised—objections which it has waived." *Id.* "Furthermore," Petitioner argues, Patent Owner "does not explain how the question is "vague, ambiguous, and confusing," and that "summarily saying it is without more is insufficient to challenge admissibility." *Id.* at 1–2 (citing 37 CFR § 42.20 (c); *Samsung Electronics America, Inc. v. Uniloc 2017 LLC*, IPR2017-01798, Paper 32, 103 (PTAB Jan. 31, 2019)).

Petitioner also points out that:

> the party proffering a witness for cross-examination has the opportunity to conduct redirect examination of the witness immediately following the cross-examination to cure any perceived deficiency or to provide a more complete answer. *See* 37 CFR § 42.53(c)(2); *CBS Interactive Inc. v. Helferich Patent Licensing, LLC,* IPR2013-00033, Paper 101 (Oct. 7, 2013); *Garmin Int'l, Inc. v. Cuozzo Speed Techs. LLC*, IPR2012-00001, Paper 50 (July 18, 2013). Here, IPA did not avail themselves of this opportunity. Ex. 1129, 164:15-16 ("MS. ABDULLAH: IPA does not have any redirect").

Paper 36, 2.

In its Reply (Paper 38), Patent Owner argues "[t]he vague, ambiguous, confusing, lack of foundation, and legal conclusion nature of questions asked by Microsoft's counsel in Exhibit 1129 is clear both on its face and by Dr. Medvidovic's deposition response," and that "[Patent Owner's] counsel properly and timely objected." Paper 38, 1.

We are not persuaded by Patent Owner's arguments that Dr. Medvidovic's testimony should be excluded from evidence in this proceeding. Although Patent Owner's counsel did state the word "Objection" in response to Petitioner's question to Dr. Medvidovic, Patent Owner's counsel did not state the nature of objection, thus depriving Petitioner's counsel of the opportunity to cure the objection by rephrasing the question.

In its Motion to Exclude, Patent Owner now takes the position that the question is "vague, ambiguous, confusing, lacks foundation and calls for a legal conclusion." Paper 35, 1. Patent Owner, however, does not explain adequately how the question is vague, ambiguous or confusing, other than to state that "Dr. Medvidovic['s] testimony highlights the vague, ambiguous, and confusing nature of Microsoft's question." *Id.* at 2. Nor does Patent Owner explain adequately how the question lacks foundation or calls for a legal conclusion aside from pointing to Dr. Medvidovic's response that "[t]his is a legal thing, not a technical thing" in reference to the term "preferred embodiment." *Id.*

Patent Owner also argues that Dr. Medvidovic's response to the question is "irrelevant, prejudicial, and misleading." *Id.* at 4. Dr. Medvidovic's testimony, however, concerns his understanding of a preferred embodiment described in the '115 patent and his opinion of whether the prior art, in particular, Kiss, teaches a "facilitator." *See, e.g.,* Ex. 1129,

52:15–54:21. We find it difficult to see how Dr. Medvidovic's testimony is "irrelevant," since it goes to his understanding of the '115 patent, the asserted prior art, and the nature of his opinion in this proceeding.

It is also relevant to note, as Petitioner points out, that Patent Owner's counsel had "the opportunity to conduct redirect examination of the witness immediately following the cross-examination to cure any perceived deficiency or to provide a more complete answer." Paper 36, 2 (citing 37 CFR § 42.53(c)(2); *CBS Interactive Inc. v. Helferich Patent Licensing, LLC*, IPR2013-00033, Paper 101 (Oct. 7, 2013); *Garmin Int'l, Inc. v. Cuozzo Speed Techs. LLC*, IPR2012-00001, Paper 50 (July 18, 2013). Patent Owner's counsel, however, declined to redirect any questions to Dr. Medvidovic. *See* Ex. 1129, 164:15–16.

As for Dr. Medvidovic's testimony being prejudicial or misleading, the Board, sitting as a non-jury tribunal with particular administrative and technical expertise, is not as vulnerable to being misled or prejudiced as a jury might, and is well-positioned to determine and assign appropriate credibility and weight to the evidence presented at trial, without resorting to a formal exclusion of evidence that might later be held to be reversible error. *See, e.g., Liberty Mutual Insurance Co. v Progressive Casualty Insurance Co.*, Case CBM2012- 00002, slip op. at 70 (PTAB, Jan, 23, 2014) (Paper 66), *Gnosis S.P.A., et al. v S. Alabama Medical Science Foundation,* Case IPR2013-00118, slip op. at 43 (PTAB June 20, 2014) (Paper 64).

For these reasons, we deny Patent Owner's Motion.

III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–3, 11, and 48–60 of the '115 patent are unpatentable on the bases set forth in the following table.[32]

Claims	35 U.S.C. §	References	Claims Shown Unpatentable	Claims Not shown Unpatentable
1–3, 11, 48–60	103	Kiss, FIPA97	1–3, 11, 48–60	
Overall Outcome			1–3, 11, 48–60	

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

IV. ORDER

In consideration of the foregoing, it is hereby

ORDERED that Petitioner has demonstrated by a preponderance of the evidence that claims 1–3, 11, 48–60 of U.S. Patent No. Patent 6,851,115 B1 are *unpatentable*; and

FURTHER ORDERED that Patent Owner's Motion to Exclude is *denied*; and

FURTHER ORDERED that because this is a Final Written Decision, any party to the proceeding seeking judicial review of this Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

PETITIONER:

Joseph Micallef
Scott Border
Ethan Plail
SIDLEY AUSTIN LLP
jmicallef@sidley.com
sborder@sidley.com
eplail@sidley.com

PATENT OWNER:

Steven Hartsell
Sadaf Abdullah
Alexander Gasser
Sarah Spires
SKIERMONT DERBY LLP
shartsell@skiermontderby.com
sabdullah@skiermontderby.com
agasser@skiermontderby.com
sspires@skiermontderby.com