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McDonnell Boehnen Hulbert & Berghoff LLP/BOEING 300 South Wacker Drive, Suite 3100 Chicago, IL 60606			MOLL, NITHYA JANAKIRAMAN	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte HAIQIN WANG, GUIJUN WANG, SHARON F. ARROYO,
ROBERT J. RENCHER, and JAMES P. TJELLE

Appeal 2019-000550
Application 13/176,236
Technology Center 2100

Before ERIC S. FRAHM, JAMES W. DEJMEK, and
MICHAEL T. CYGAN, *Administrative Patent Judges*.

CYGAN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1, 4–10, 13–17, 21–26, and 28. Appeal Br. 8–9. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42 (2017). Appellant identifies the real party in interest as The Boeing Company. Appeal Br. 1.

CLAIMED SUBJECT MATTER

The claimed invention is directed to modeling and analyzing quality of service characteristics of federated cloud services. *Abstr.*; *Spec.* ¶ 1. Web portals are generally federated ecosystems of content providers, vendors, advertisers, supporting services, and consumers. *Spec.* ¶ 2. In the field of travel management, federated cloud services may involve airline reservation systems, hotel and rental car reservation systems, advertisers, maps, weather, and local information. *Id.* ¶ 3. Appellant's claimed invention derives and evaluates quality of service characteristics of the federated cloud services using a composite model. *Id.* ¶ 4. Entities of a federated service system are identified and classified. *Id.* The inter-entity relationships are identified, and each are classified as a primitive model. *Id.* A composite model of the federated service system is formed from the entities, entity classifications, relationships, and relationship classifications. *Id.* According to the Specification, this permits a network service provider to select a host service that can operate with desired quality of service characteristics. *Id.* ¶ 5.

Independent claim 1 is representative, with the limitations at issue italicized for emphasis:

1. A method, comprising:
determining, by a modeling system, a plurality of entity classifications of a plurality of entities of a federated service system using entity classifications that comprise a service classification, a host computer classification, and a network segment classification, wherein the modeling system comprises a processor module and a memory module, and wherein the federated service system provides at least one commercial aviation service that includes one or more flight, hotel, and/or car rental reservation services;

identifying, by the modeling system, a plurality of inter-entity relationships between the entities of the federated service system based on plurality of primitive models comprising:

a first primitive model for a functional relationship between a first service of the federated service system using one or more second services of the federated service system, wherein the functional relationship includes one or more of:

a one-to-one functional relationship where the first service uses one second service of the one or more second services, a one-to-all functional relationship where the first service uses all of the one or more second services, and a one-to-many functional relationship where the first service uses a subset of the one or more second services;

a second primitive model for a temporal relationship between the first service and the one or more second services, *wherein the temporal relationship includes an alternative temporal relationship where the first service uses the one or more second services in a non-persistent sequential order;*

a third primitive model for a connection relationship between the first service and the one or more second services via one or more network communication segments of the federated service system; and

a fourth primitive model for a hosting relationship between the first service and one or more host computers of the federated service system;

generating, using the modeling system, a composite model of the federated service system using a set of building blocks representing the plurality of primitive models, wherein each building block is configured for analyzing quality of service (QoS) characteristics for a represented primitive model, and wherein the composite model is based on the plurality of entity classifications and the plurality of inter-entity relationships; and

generating an output of the modeling system that is based upon the composite model, wherein the output comprises a report of one or more QoS characteristics of the federated service system based on the composite model, and wherein the one or more QoS characteristics comprise a performance characteristic; and providing the at least one commercial aviation service.

Claims Appx.

Independent claims 10 and 25 recite, respectively, a system and storage medium having limitations commensurate in scope with claim 1. *Id.* Dependent claims 4–9, 13–17, 21–24, and 26–28 each incorporate the limitations of their respective independent claims. *Id.*

REFERENCES

Name	Reference	Date
Buyya et al. (Buyya)	Buyya, R., Ranjan, R., and Calheiros, R., <i>Modeling and Simulation of Scalable Cloud Computing Environments and the CloudSim Toolkit: Challenges and Opportunities</i> , International Conference on High Performance Computing and Simulation (HPCS) (2009). ²	2009
Dettinger et al. (Dettinger)	US 2006/0122993 A1	Jun. 8, 2006 Filed Dec. 6, 2004
Novak et al. (Novak)	US 2009/0022098 A1	Jan. 22, 2009
Ceri et al. (Ceri)	Stefano Ceri, Barbara	May 1987

² Information Disclosure Statement by Applicant 2 (July 5, 2011).

	Pernici, and Gio Wiederhold, <i>Distributed Database Design Methodologies</i> , 75 Proceed. IEEE 533 (May 1987)	
Deng et al. (Deng)	US 2012/0005236 A1	Jan. 5, 2012 Filed Jul. 1, 2010
Yemini et al. (Yemini)	US 2005/0021742 A1	Jan. 27, 2005 Filed Mar. 31, 2004

REJECTIONS

Claims 1, 4, 5, 7, 8, 10, 13, 15, 23–25, and 28 are rejected under pre-AIA 35 U.S.C. § 103(a) as being obvious over the combined teachings and suggestions of Buyya, Dettinger, Novak, and Ceri.

Claims 6, 16, 17, and 26 are rejected under pre-AIA 35 U.S.C. § 103(a) as being obvious over the combined teachings and suggestions of Buyya, Dettinger, Novak, Ceri, and Deng.

Claims 9, 14, 21, and 22 are rejected under pre-AIA 35 U.S.C. § 103(a) as being obvious over the combined teachings and suggestions of Buyya, Dettinger, Novak, Ceri, and Yemini.

Claim 27 has been indicated as being rejected under 35 U.S.C. § 101, but containing allowable subject matter because the applied reference fails to teach certain specified claim limitations. Final Act. 17. However, the Final Office Action also indicated that all rejections under 35 U.S.C. 101 have been withdrawn in view of the limitation to “providing the commercial aviation service, out of the at least one of flight, hotel, and car reservation services.” *Id.* at 2. The Examiner has clarified that claim 27 is not rejected

under 35 U.S.C. § 101 and that wording to the contrary in the Final Action was a typographical error. Ans. 5. Accordingly, we treat the rejection of claim 27 under § 101 as being withdrawn.³

OPINION

Appellant focuses their arguments on the recitation in claim 1 of “**an alternative temporal relationship where the first service uses the one or more second services in a non-persistent sequential order.**” Appeal Br. 9–14; Reply Br. 1–5. With respect to that recitation, Appellant asserts that the Examiner has not shown this to be taught any of the applied references, and in particular, that the Novak reference cited for such a teaching lacks such a teaching.

To teach or suggest the aforementioned limitation, the Examiner has relied upon teachings of Buyya and Novak. The Examiner relies upon Buyya for a temporal relationship between services wherein the first service uses one or more second services. Final Act. 4 (citing Buyya 2 (“time-shared allocation of processing cores to virtualized services”), 3 (“Clouds and their federated network mediated by a Cloud exchange,” Fig. 2)). The Examiner further relies upon Novak’s “non-persistent resource assignments.” *Id.* 8. The Examiner finds the resource assignment of Novak to be analogous to one service using another service. *Id.* Both the Examiner and Appellant agree that in Novak, first, second, and further sequential resources are allocated in a predetermined manner to users. Final Act. 8; Appeal Br. 11 (citing Novak ¶ 353).

³ Should further prosecution occur, we invite the Examiner to reconsider the withdrawal of the rejection, based on the specified claim language, in view of the current § 101 guidance.

Appellant argues that the claim term “non-persistent sequential order” is not met by Novak because that term is defined in the Specification as one in which the order “does not matter.” Appeal Br. 11. As characterized by Appellant, Novak “discloses [a] ‘sequential reading of bitmap’ (Novak ¶ 426) which imposes a sequential ordering on Novak’s non-persistent assignments,” and, “resources are allocated in a predetermined manner.” *Id.* at 12 (citing Novak ¶ 353) (emphasis omitted). Appellant argues that a predetermined manner of ordering is not a “non-persistent sequential order,” because “going in order differs from the [Specification’s] example of ‘a sub-service used first at one time can be used second at another time.’” *Id.* (citing Spec. ¶ 52). Appellant contends that Novak’s “imposition of a sequential order on non-persistent assignments” does not teach a “non-persistent sequential order” in view of the aforementioned definition and example set forth in the Specification. *Id.* at 13.

We discern no pertinent distinction between the claimed “non-persistent sequential order” and Appellant’s characterization of Novak’s teaching of “non-persistent assignments” that are made in a “sequential order.” Appeal Br. 13. Although the claim is interpreted in light of the written description, “it is important not to import into a claim limitations that are not part of the claim.” *Superguide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004). Appellant’s argument is grounded in the “does not matter” language in the Specification. *See* Appeal Br. 11–13 (citing Spec. ¶ 52). The cited portion of the Specification states, “a service can use the sub-level supporting services in sequence, but an order of using the sub-level supporting services does not matter. For example, but without limitation, a sub-service used first at one time can be used second at

another time.” Spec. ¶ 52. As viewed in light of the Specification, the claim requires that the order be sequential, which Appellant acknowledges to be taught by Novak. Appeal Br. 12. The claim further requires that the order be non-persistent, such that the services need not always be used in the same order, which is also admittedly taught by Novak. *Id.*; *see also* Novak ¶¶ 412 (“[a]ssignment may be . . . non-persistent assignment”), 414 (“[f]or non-persistent allocation . . . allocation or placement of any resource can be changed”). Although the Appellant interprets the Specification as further requiring that the order not be “predetermined,” we are not persuaded that such is necessary to teach or suggest the claimed “non-persistent sequential order.” The Specification does not clearly set forth a definition of “non-persistent sequential order” that precludes an ordering that is in a predetermined sequential order that is also non-persistent, as Appellant acknowledges to be taught by Novak. Accordingly, we are not persuaded that the Examiner erred in determining that Novak teaches or suggests the disputed limitation because Novak provides that “resources may be allocated in a predetermined manner.”

Appellant also argues that Novak’s “resource assignments” differ from “use” of “one or more services in a non-persistent sequential order.” Appeal Br. 13. Appellant provides definitions of “allocate” and “use,” taken from the 1981 version of Webster’s New Collegiate Dictionary (hereinafter “Webster’s”), in support of this argument. *Id.* Under those definitions, “allocate” is defined as “to apportion for a specific purpose or to particular persons or things; DISTRIBUTE,” and “use” is defined as “to put into action or service.” *Id.* (citing Webster’s at 30 (definition 1), 1279 (definition 2)). Appellant contends that these definitions show that, contrary to the

Examiner's assertions, "'allocate' differs from and is not a subset of 'use.'" *Id.* Appellant argues that a resource may be allocated to an entity, but the entity may or may not actually deploy (or use) the resource. Reply Br. 5.

We do not find Appellant's argument persuasive. Novak equates the terms "use" and "allocate" in the context of allocation of resources, describing certain resources as "unused (not allocated) resources." Novak ¶ 401. Although both Appellant and the Examiner (Ans. 13) have provided dictionary evidence as to the possible meaning of the term "allocate" as used in Novak, we determine that Novak's statement equating "allocate" and "use" illuminates the specific issue as to whether Novak teaches or suggests "use" of a resource.

Furthermore, the Examiner has relied not solely on Novak, but on the combination of teachings and suggestions of Novak and Buyya. The Examiner finds, and Appellant has not contested, that Buyya teaches that the first service uses the second service(s) with respect to the first model. Final Act. 4 (finding the first service uses the second service(s) of the federated system). Further, relating to the second model, the Examiner has found, and Appellant has not contested, that Buyya teaches "time-shared allocation of processing cores to virtualized services." *Id.* (quoting Buyya 2).

In view of the teachings of Novak and Buyya as cited by the Examiner, the definitions provided by the Appellant and Examiner, and Novak's statement that "unused" is "not allocated," we are not persuaded by Appellant that the Examiner's combination of Novak and Buyya does not teach or suggest the claimed "first service uses the one or more second services in a non-persistent sequential order."

Appellant further argues that the rejections of claims 4, 5, 7, 8, 10, 13, 15, 23–25, and 28 are erroneous for the same reasons as argued against the rejection of claim 1. Appeal Br. 15. For the same reasons as discussed with respect to claim 1, we sustain the obviousness rejection of claims 4, 5, 7, 8, 10, 13, 15, 23–25, and 28. *See* 37 C.F.R. § 41.67(c)(iv).

Appellant further argues that the rejections of claims 6, 9, 14, 16, 17, 21, 22, and 26 are erroneous for the same reasons as argued against the rejection of claim 1, and further, that the addition of the teachings of either Deng, or Yemini do not cure the error. Appeal Br. 15–16. For the same reasons as discussed with respect to claim 1, we sustain the obviousness rejection of claims 6, 9, 14, 16, 17, 21, 22, and 26.

CONCLUSION

For the above-described reasons, we affirm the Examiner’s rejection of claims 1, 4–10, 13–17, 21–26, and 28 as being obvious under 35 U.S.C. § 103(a).

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	References/Grounds	Affirmed	Reversed
1, 4, 5, 7, 8, 10, 13, 15, 23–25, 28	103(a)	Buyya, Dettinger, Novak, Ceri	1, 4, 5, 7, 8, 10, 13, 15, 23–25, 28	
6, 16, 17, 26	103(a)	Buyya, Dettinger, Novak, Ceri, Deng	6, 16, 17, 26	
9, 14, 21, 22	103(a)	Buyya, Dettinger, Novak, Ceri, Yemini	9, 14, 21, 22	

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Overall Outcome			1, 4–10, 13–17, 21– 26, 28	
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TIME PERIOD FOR RESPONSE

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

AFFIRMED