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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte AABHAS V. PALIWAL, NABIL ADAM, and
CHRISTOF BORNHOEVD

Appeal 2018-008892
Application 11/543,635
Technology Center 2100

Before JOHNNY A. KUMAR, LINZY T. McCARTNEY, and
MATTHEW J. McNEILL , *Administrative Patent Judges*.

KUMAR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF CASE

Introduction

Appellant¹ appeals under 35 U.S.C. § 134 from a final rejection of claims 1–4, 6–17, and 19–27. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Representative Claim

Representative claim 1 under appeal reads as follows:

1. A system comprising:

a processor,

a memory accessible to the processor for storing a service request;

an interface to receive the service request including a request set of keywords;

an enhancement unit to compute an enhanced request set of keywords comprising keywords of the request set of keywords of the service request and an enhancement keyword, the enhancement keyword being represented by an ontology concept, a keyword of the request set of keywords being represented by a further ontology concept, the ontology concept being related to the further ontology concept, the ontology concept being from an ontology of an ontology framework, the enhancement unit to identify a correspondence between a keyword of the request set of keywords and a name of a concept from the ontology, the identified correspondence enabling the enhancement unit to identify the enhancement keyword from the corresponding name of the concept;

a matching unit to identify a service to match the service

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as SAP SE. Appeal Br. 3.

request based on service functionality by computing a similarity between the enhanced request set of keywords and a functionality corresponding to each of a plurality of available services as defined by a service set of keywords of the service, the computed similarity being based in part on at least one keyword of the requester set of keywords of the enhanced request set of keywords as related to service descriptions and service description tags for each of the plurality of available services, the computed similarity computed by computing a reduced representation of the enhanced request set of keywords by projecting a vector representing the enhanced request set of keywords onto a subspace, by computing a further reduced representation of the plurality of available services by projecting a vector representing the service set of keywords onto a subspace, and by identifying the similarity with a value to which the reduced representation and the further reduced representation are mapped; and

a ranking unit to rank the identified service with respect to quality of service parameters of the identified service.

Appeal Br. 37–38 (Claims App.).

Rejections

1. Claims 1–4, 6, 8–17, and 21–27 are rejected under 35 U.S.C. § 103(a) as rendered obvious by Altenhofen et al. (US 2006/0161655 A1, published July 20, 2006 (hereinafter “Altenhofen”)), in further view of Budak Arpinar et al., “Ontology-Driven Web Services Composition Platform” (“NPL Ontology”) (2004).¹

¹ The Examiner refers to the Arpinar reference as the NPL Ontology reference. (Ans. 4). In our decision, we will refer to this reference as either Arpinar or NPL Ontology.

2. Claims 7 and 20 are rejected under 35 U.S.C. § 103(a) as rendered obvious by Althenhofen, in further view of NPL Ontology, in further view of Grefenstette et al. (US 2003/0061201 A1; published Mar. 27, 2003 (hereinafter “Grefenstette”)).

Appellant’s Contentions

1. Appellant contends that the Examiner erred in rejecting independent claim 1 because:

Althenhofen discusses analyzing “the semantic web service instance description ‘DB’ with respect to words of a defined vocabulary derived from ontologies” and a finding of words based on the analysis. A publishing component “compares those words with an overall index in which all words of the defined vocabulary are deposited together with network nodes to which they are assigned.” More importantly, Althenhofen, for example, augments a vocabulary with new words. Althenhofen does not disclose or suggest “computing a reduced representation of the enhanced request set of keywords by projecting a vector representing the enhanced request set of keywords onto a subspace” and “by computing a further reduced representation of the plurality of available services by projecting a vector representing the service set of keywords onto a subspace.”

Regarding the claimed projection of a vector, it is noted that projecting a vector includes, for example, mapping a vector from a vector space onto a subspace, as would be apparent to a person of ordinary skill in the art. Althenhofen does not disclose or suggest vectors and does not disclose or suggest the projection of a vector.

Appeal Br. 20 (emphasis and footnotes omitted).

Arpinar discusses “four cases to check similarity (i.e., matching) of an output and input parameter from the same ontology” and that a “first step is to consider all inputs by semantically matching them with all WSs [Web Services] that take one or more of them as input.” Thus, Arpinar teaches away

from the claimed embodiment by teaching to consider all inputs by semantically matching them with all WSs. While Arpinar suggests that a “user is given the option to discard elements in this new set of input parameters [generated by the system] that may no longer be needed”, that the “user may also mark some of the new input as ‘optional’”, and that “[t]his helps in the ranking of the list of WSs that will be shown to the user in subsequent stages”, Arpinar does not disclose or suggest using the cited new set of input parameters generated by the system to identify a “similarity with a value to which the reduced representation and the further reduced representation are mapped.”

Appeal Br. 20–21 (emphasis and footnotes omitted); *see also* Reply Br. 3–4.

2. Appellant contends that the Examiner erred in rejecting claims 2 and 15 because:

Arpinar discusses “semantics of a domain such as the terms and concepts of interest, their meanings, relationships between them and the characteristics of the domain through an ontology.” It is unclear which elements “them” refers to in the phrase “relationships between them” in Arpinar. Semantics of a domain such as the terms and concepts of interest, their meanings, and relationships between them is not equivalent to a relation between concepts of two ontologies and is not equivalent to a relation between a first concept of a first ontology and a second concept of a second ontology. Moreover, a relationship between ontologies, as alleged by the Examiner, is not equivalent to a relationship between different concepts of different ontologies. Arpinar does not disclose or suggest “wherein the ontological concept being linked to a second ontology by a relation between a first concept of a first ontology and a second concept of a second ontology.”

Appeal Br. 22 (emphasis and footnotes omitted); *see also* Reply Br. 4–5.

3. Appellant contends that the Examiner erred in rejecting claims 6 and 19 because:

Altenhofen discusses analyzing “the semantic web service instance description ‘DB’ with respect to words of a defined vocabulary derived from ontologies” and comparing “those words with an overall index in which all words of the defined vocabulary are deposited together with network nodes to which they are assigned.” Comparing words of a defined vocabulary with an index is a comparison operation and does not infer the existence of either “correlations between keywords of documents related to the plurality of available services and the documents related to the plurality of available services,” or representations of such correlations.

Appeal Br. 25 (emphasis and footnotes omitted); *see also* Reply Br. 5).

ANALYSIS

We have reviewed the Examiner’s rejections in light of Appellant’s contentions that the Examiner has erred.

We agree with the Examiner and adopt as our own (1) the findings and reasons set forth by the Examiner in the action from which this appeal is taken and (2) the reasons set forth by the Examiner in the Examiner’s Answer in response to Appellant’s Appeal Brief (*see* Ans. 3–7). However, we highlight and address specific findings for emphasis as follows.

As to above contention 1, we disagree with Appellant’s arguments.

First, we agree with the Examiner that “vector,” as recited in claim 1, means “a quantity having direction as well as magnitude, especially as determining the position of one point in space relative to another.” Ans. 4.

Second, the Examiner finds that in NPL Ontology:

Computing a reduced representation can be readily accomplished by adding more terms to the search, as adding further terms narrows the results that can match. In other words, the initial set of keywords would match a corresponding representation reflecting the results, and computing a reduced

representation would be readily accomplished by adding more terms, which restrict the result set.

For example, in NPL Ontology on page 10, the art contemplates the example of “wine” being a subclass of “alcohol”, which is itself a subclass of “drink”. It is therefore clear that considering all three of these elements produces a reduced representation, as the number of results that will match all three is necessarily narrower than the results that would match just “drink” in isolation. Similarly, *this shows a “vector”, as this shows both a direction (that is, narrower), and a magnitude (different level reflecting different degrees of separation)*. Page 15 of NPL [Ontology] is even clearer about the vector, where the *“composition result” is determined at least in part based on “the quality rate of the service” and “the distance from start service to this service”, the quality and distance being the two elements of a vector.*

Ans. 5–6 (emphasis in original omitted, our emphasis added).

In other words, NPL Ontology’s “composition result” teaches the claimed “vector” limitation. Ans. 6. (citing NPL Ontology 15).

We agree with the Examiner’s findings because Appellant has not cited to an *explicit definition* of “vector” in the Specification. Appellant has not presented any persuasive evidence to convince us that the Examiner’s interpretation of “vector” is in error.

Thus, the Examiner, giving the claim its broadest reasonable interpretation consistent with the Specification, has properly found that NPL Ontology discloses the disputed vector limitation, as explained above.

As to above contention 2, NPL Ontology teaches the first/second ontologies limitation. The Examiner finds, and we agree:

It is unclear why “a relationship between ontologies” is distinct from “a relationship between different concepts of different ontologies”. All ontologies by definition define a set of concepts. If two ontologies are distinct, as taught by NPL

Ontology, it necessarily follows that [they] are “different ontologies” and therefore are “different concepts”. Like a mathematical set, even a single element of difference is sufficient for the sets to be distinct and related to different conceptual frameworks.

Ans. 6.

As to above contention 3, about the correlations limitation, Appellant defines “[a] correlation between two things is a *relationship between two things.*” Reply Br. 5 (emphasis added).

The Examiner finds the correlations limitation is taught by NPL Ontology as explained below. In particular, the Examiner cites to:

NPL Ontology p. 13 & 18-19; disclosing using *hierarchical relationships and edge eight calculations to determine what services are relevant to the user provided search*, and disclosing using various possible weight calculations to obtain different results, the results being both narrower than the originally considered set and identified using a *similarity value*.

Final Act. 8 (emphasis added) (citing NPL Ontology 13, 18, and 19).

We agree with the Examiner because the claimed correlations, i.e., relationships, encompass NPL Ontology’s similarity value.

Regarding Appellant’s additional arguments for patentability of claims 7, 8, 10–13, 16, 20, 21, and 23–26 (Appeal Br. 26–35), we adopt the Examiner’s findings and underlying reasoning (Final Act. 8–18), which are incorporated herein by reference.

Consequently, Appellant has failed to show error in the Examiner’s rejections of claims 1–4, 6–17, and 19–27.

CONCLUSION

The Examiner has not erred in rejecting 1–4, 6–17, and 19–27 as being unpatentable under 35 U.S.C. § 103.

The Examiner’s rejections of claims 1–4, 6–17, and 19–27 as being unpatentable under 35 U.S.C. § 103 are **affirmed**.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–4, 6, 8–17, 21–27	103	Altenhofen, NPL Ontology	1–4, 6, 8–17, 21–27	
7, 20	103	Altenhofen, NPL Ontology, Grefenstette	7, 20	
Overall Outcome			1–4, 6–17, 19–27	

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