

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte FABIO CASATI, MING-CHIEN SHAN, and
UMESHWAR DAYAL

Appeal 2007-3778
Application 09/985,081
Technology Center 2100

Decided: February 27, 2008

Before JEAN R. HOMERE, JAY P. LUCAS, and,
ST. JOHN COURTENAY III, *Administrative Patent Judges*.

COURTENAY, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-9, 11, 14, and 21-29. Claims 10, 12, 13 and 15-20 have been cancelled. We have jurisdiction under 35 U.S.C. § 6(b). We affirm in part. We also enter a new ground of rejection against independent claim 27 under the provisions of 37 C.F.R. § 41.50 (b).

THE INVENTION

The disclosed invention relates generally to software systems for computer networking, and more particularly toward a software system for monitoring, analyzing, predicting, and improving the quality of performance of electronic services provided via a computer network (Spec. 1).

Independent claim 1 is illustrative:

1. A method of analyzing quality of electronic services hosted by an electronic services platform, comprising:

specifying at least one quality criterion whose score for a particular transaction indicates quality of execution of an electronic service hosted by a platform with respect to that transaction;

retrieving electronic service execution data for a plurality of executions of the electronic service, the electronic service execution data comprising a plurality of transaction properties for each transaction executed by the electronic service; and

using a data mining tool to mine the electronic service execution data for the purpose of automatically identifying a hidden pattern related to the quality criterion in the electronic service execution data.

THE REFERENCES

The Examiner relies upon the following references as evidence in support of the rejection:

Aggarwal	US 6,094,645	Jul. 25, 2000
Scarlat	US 6,477,483 B1	Nov. 5, 2002

THE REJECTION

Claims 1-9, 11, 14, and 21-29 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Scarlat in view of Aggarwal.

PRINCIPLES OF LAW

“What matters is the objective reach of the claim. If the claim extends to what is obvious, it is invalid under § 103.” *KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1742 (2007). To be nonobvious, an improvement must be “more than the predictable use of prior art elements according to their established functions.” *Id.* at 1740. Appellants have the burden on appeal to the Board to demonstrate error in the Examiner’s position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) (“On appeal to the Board, an applicant can overcome a rejection [under § 103] by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.”) (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)). Therefore, we look to Appellants’ Brief to show error in the proffered *prima facie* case.

ISSUE(S)

We have determined the following issues are dispositive in this appeal:

- (1) Whether Appellants have shown that the Examiner has failed to articulate an adequate reasoning with a rational underpinning to support the proffered

combinability of Scarlet and Aggarwal (*see* Appellants' arguments, App. Br. 14-16).

- (2) Whether Appellants have shown the Examiner erred in finding that the proffered combination of Scarlet and Aggarwal teaches and/or suggests the following limitations:

using a data mining tool to mine the electronic service execution data for the purpose of automatically identifying a hidden pattern related to the quality criterion in the electronic service execution data.

(*see* independent claim 1; *see also* identical language as used in independent claim 27, and equivalent language as used in independent claim 26; *see* Appellants' arguments, App. Br. 7).

- (3) Whether Appellants have shown the Examiner erred in finding that the proffered combination of Scarlet and Aggarwal teaches and/or suggests a "prediction model," as recited and applied in dependent claims 21-23 (*see* Appellants' arguments, App. Br. 16-17).

ANALYSIS

Combinability under 35 U.S.C. § 103

We consider first the combinability of the Scarlet and Aggarwal references under 35 U.S.C. § 103, as applicable to all claims on appeal. Appellants contend that the Examiner has provided insufficient evidence of motivation to combine the transactional server load testing system taught by

the primary Scarlat reference with the data mining system taught by the secondary Aggarwal reference (*see* App. Br. 14-16).

In view of the Supreme Court's recent opinion in *KSR Int'l Co. v. Teleflex Inc.*, our analysis here does not turn upon whether the Examiner has provided an adequate teaching, suggestion, or motivation to combine the references. Instead, we view the question before us to be whether sufficient difference exists between the prior art and Appellants' claims to render the claims nonobvious. In *KSR*, the Supreme Court reaffirmed that "[w]hen a patent 'simply arranges old elements with each performing the same function it had been known to perform' and yields no more than one would expect from such an arrangement, the combination is obvious." *KSR*, 127 S. Ct. at 1740 (quoting *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 282 (1976)).

This reasoning is applicable here. After considering the evidence before us, it is our view that Aggarwal provides compelling evidence that data mining is a familiar concept that is well established in the computer science art. Aggarwal expressly teaches that data mining may be applied to an extremely broad spectrum of applications, as follows:

In general, data mining is a process of nontrivial extraction of implicit, previously unknown and potentially useful information from data in databases. *The discovered knowledge can be applied to information management, query processing, decision making, process control, and many other applications.* Furthermore, several emerging applications in information providing services, such as on-line services and the World Wide Web, also call for various data mining techniques to better understand user behavior, to meliorate the service

provided, and to increase the business opportunities [emphasis added].
(Aggarwal, col. 1, ll. 21-31).

Moreover, Aggarwal expressly teaches that data mining techniques may be applied to many different types of databases, including transaction databases (col. 1, l. 45).

It is our view that an artisan possessing ordinary skill and creativity would have been capable of combining familiar elements such as the transactional server load testing system taught by Scarlet with Aggarwal's data mining system to arrive at the claimed invention. Thus, we conclude that Appellants' claims are directed to familiar elements that would have been readily combinable by an artisan possessing ordinary skill, creativity,¹ and common sense using known methods in a manner that would have yielded predictable results.

Our reviewing court has reaffirmed that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Leapfrog Enter., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007) (quoting *KSR*, 127 S. Ct. at 1739). Here, we note that Appellants have not rebutted the Examiner's legal conclusion of obviousness by showing that the claimed combination of familiar elements produces any new function. Moreover, Appellants have not provided any factual evidence of secondary considerations, such as unexpected or unpredictable results, commercial success, or long felt but

¹ Courts should “take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 127 S. Ct. at 1741.

unmet need. Accordingly, we find Appellants' arguments unpersuasive that the cited references have been improperly combined by the Examiner.

Elements

Claims 1-9, 11, 14, and 24-29

We consider the Examiner's rejection of claims 1-9, 11, 14, and 24-29 as being unpatentable over Scarlat in view of Aggarwal. Since Appellants' arguments with respect to this rejection have treated these claims as a single group which stand or fall together, we select independent claim 1 as the representative claim for this rejection. *See* 37 C.F.R. § 41.37(c)(1)(vii)(2006).

Claim Construction

We begin our analysis by broadly but reasonably construing the scope of the claimed "data mining." (*See* independent claims 1, 26, and 27). We decline to construe Appellants' claims in light of the multiple extrinsic dictionary definitions proffered by Appellants and the Examiner. Our reviewing court has determined that "the specification is 'the single best guide to the meaning of a disputed term,' and that the specification 'acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1321 (Fed. Cir. 2005) (*en banc*) (internal citation omitted).

We note that it is the Appellants' burden to precisely define their invention, not the PTO's. *See In re Morris*, 127 F.3d 1048, 1056 (Fed. Cir. 1997). Here, when we look to Appellants' Specification for *context*, we find a data mining reporting tool 82, described as follows:

Data in the warehouse 60 are retrieved by an e-services intelligence (ESI) engine 66 that prepares the data for processing by data mining tools 82. Based on its analysis, the reporting tool 82 also creates classification and prediction models 69. These models 69 suggest how certain e-service transactions will perform based on the analysis of the data. For example, the tool 82 might identify those services delivered on weekends that have low quality. The models 69 may be used to identify ways to restructure the eservice 30-32 to make it perform better. Also, the models 69 may be used dynamically at run-time of the e-service 30-32 to direct the use of resources. (Spec. 11, ll. 14-21).

Significantly, while the term “data mining tools 82” is used literally on page 11 of the Specification (as described above), we find the same element 82 is described elsewhere in the Specification (in one particular embodiment) as “a commercially-available reporting tool 82, such as Microsoft Excel or an on-line analytical processing (OLAP) tool.” (*See* Spec. 6, ll. 17-18; *see also* Fig. 8, where element 82 is also described as a “Commercially-Available Reporting Tool With Data Mining Capabilities”). Therefore, in view of the breadth of interpretations of the data mining tools we find as support in the Specification, we broadly but reasonably construe the claimed data mining tool as a tool that at least performs an analysis of data for the purpose of improving performance or discerning predictable trends. We also construe the claimed data mining tool as broadly encompassing commercially-available reporting tools that perform equivalent data analysis functions.

Thus, when the term “data mining” is broadly but reasonably construed in light of Appellants’ own disclosure, we conclude that the scope

of the claimed data mining tool that “mine[s] the electronic service execution data for the purpose of automatically identifying a hidden pattern related to the quality criterion in the electronic service execution data” (claim 1) reasonably encompasses the data mining tool(s) taught by Aggarwal (as applied to the performance data of Scarlet, col. 6, ll. 22-33). Moreover, we find Aggarwal teaches and/or suggests the general concept of automatically identifying a hidden pattern in the data being mined, as described as follows:

Since it is difficult to predict what exactly could be discovered from a database, a high-level data mining query should be treated as a probe which may disclose some interesting traces for further exploration.
(col. 1, ll. 31-34).

Regarding the Scarlet reference, we find that Scarlet teaches collecting or aggregating load testing performance data that relates to “quality criterion in the electronic service execution data,” as claimed (*see* instant claims 1, 26, 27), as follows:

The transaction response times and other performance data generated during load testing are aggregated within the customer database 44, and are reviewed and analyzed by the service provider using the various charts and reports provided by the load testing application 42. Some or all of the performance data may also be made available to the customer for viewing via the service provider's web site 32. In addition, as mentioned above, the customer or a consultant may be able to participate in the load testing process, such as by recording additional transactions or defining new execution scenarios, using a hosted collaboration tool 38 on the service provider's web site 32.
(Scarlet, col. 6, ll. 22-33).

We further note that Appellants have expressly acknowledged in the Brief that Scarlet teaches quality criteria (*see* App. Br. 12, ¶2, i.e., “Moreover, Appellants’ own review of column 5 [of Scarlet] confirms that it essentially only concerns quality criteria.” Nevertheless, Appellants aver that Scarlet does not teach or suggest data mining (App. Br. 12, ¶2).

We note that the Examiner’s rejection is based upon the *combination* of Scarlet and Aggarwal. While Scarlet does not use the literal term “data mining” we nevertheless agree with the Examiner that Scarlet at least suggests the type of data collection and analysis routinely performed by data mining applications. We are unpersuaded by Appellants’ arguments because they are directed to the individual references in isolation rather than the combination of references as a whole. Our reviewing court has established that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

Therefore, we find that the Examiner’s proffered combination of Scarlet and Aggarwal teaches and/or suggests “using a data mining tool to mine the electronic service execution data for the purpose of automatically identifying a hidden pattern related to the quality criterion in the electronic service execution data,” as claimed (*see* independent claims 1, 27, and the equivalent language used in independent claim 26). We note that we have fully addressed the combinability of Scarlet and Aggarwal *supra*.

For at least the aforementioned reasons, we conclude that Appellants have not shown that the Examiner has erred in rejecting representative claim 1 as being unpatentable over Scarlet in view of Aggarwal. Accordingly, we

sustain the Examiner's rejection of representative claim 1 and associated claims 2-9, 11, 14, and 24-29 (which fall therewith) as being unpatentable over Scarlat in view of Aggarwal.

Claims 21-23

We consider next the Examiner's rejection of claims 21-23 as being unpatentable over Scarlat in view of Aggarwal. For convenience, we reproduce these claims below:

21. The method of claim 1, further comprising a step of creating a prediction model, based on the electronic service execution data, for predicting future behavior of the electronic service.
22. The method of claim 21, further comprising a step of modifying the electronic service based on the prediction model.
23. The method of claim 21, further comprising a step of using the prediction model during run-time to dynamically direct resources used by the electronic service.

Claim Construction

We begin our analysis by broadly but reasonably construing the scope of the recited "prediction model" of claims 21-23. Here, when we look to Appellants' Specification for *context*, we find "prediction models 69," described as follows:

Based on its analysis, the reporting tool 82 also creates classification and prediction models 69. These models 69 suggest how certain e-service transactions will perform based on the analysis of the data. For example, the tool 82 might identify those services delivered on weekends that have low quality. The models 69 may be used to identify ways to

restructure the eservice 30-32 to make it perform better. Also, the models 69 may be used dynamically at run-time of the e-service 30-32 to direct the use of resources.
(Spec. 11, ll. 15-21).

Thus, we conclude that a broad but reasonable construction of the claimed “prediction model” is a model that at least suggests how certain (future) electronic transactions will perform based on the analysis of past data (Spec. 11, ll. 16-18). Using this claim construction, we agree with the Examiner that the broad language of claims 21 and 22 reasonably encompasses Scarlat’s teaching of a service provider who informs the customer that, based upon an analysis of past performance (i.e., a performance “model”), the customer’s web site database servers will take too long to lock when a certain load level is reached. The text for this teaching is reproduced below, as follows:

The results of the service provider's analysis may be communicated to the customer through the service provider's web site 32 (e.g., through annotated performance graphs and charts), by telephone, and/or by other communications method. *As part of this process, the service provider will typically suggest modifications that will improve the performance of the web site 50. For example, the service provider might inform the customer that the web site's database servers 54 take too long to lock once the load reaches a certain level, or that the customer's ISP is violating a Service Level Agreement by providing insufficient throughput.* As depicted by steps 4b and 5, once the customer makes any suggested changes to the staged web site 50, the service provider will typically re-run the load tests to evaluate the effects of the changes. Once load testing is complete, the service provider may make the test scripts and associated files available to the customer to use for

post-deployment testing or monitoring of the web site 50
[emphasis added].
(Scarlat, col. 6, ll. 34-50).

Therefore, we conclude that Appellants have not shown the Examiner has erred in rejecting dependent claims 21 and 22 as being unpatentable over Scarlat in view of Aggarwal. We note that we have fully addressed the combinability of Scarlat and Aggarwal *supra*. Accordingly, we sustain the Examiner's rejection of these claims as being unpatentable over Scarlat in view of Aggarwal.

Claim 23

Nevertheless, our review of the record finds no reasonable teaching or suggestion of the express language of claim 23 that requires “using the prediction model *during run-time to dynamically direct resources used by the electronic service* [emphasis added].” Therefore, because we agree that Appellants have met their burden of showing error in the Examiner’s prima facie case for claim 23, we reverse the Examiner’s rejection of claim 23 as being unpatentable over Scarlat in view of Aggarwal.

CONCLUSION OF LAW

Based on the findings of facts and analysis above, we conclude that Appellants have not shown the Examiner erred in rejecting claims 1-9, 11, 14, 21, 22, and 24-29 under 35 U.S.C. § 103(a) for obviousness. However, we conclude that Appellants have shown the Examiner erred in rejecting dependent claim 23 under 35 U.S.C. § 103(a) for obviousness.

NEW GROUND OF REJECTION

We enter the following new rejection of independent claim 27 under the provisions of 37 C.F.R. § 41.50 (b).

35 U.S.C. § 101

Independent claim 27

Independent claim 27 is rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

Regarding independent claim 27, we note that a “computer-readable medium storing computer-executable process steps . . . ” is directed to statutory subject matter so long as the language of claim is not supported in the Specification with non-statutory embodiments (i.e., signals, transmission mediums and the like). *See In re Nuijten*, 500 F.3d 1346, 1357 (Fed. Cir. 2007) (A claim directed to computer instructions embodied in a signal is not statutory under 35 U.S.C. § 101). *Cp. In re Lowry*, 32 F.3d 1579, 1583-84 (Fed. Cir. 1994) (a claim to a data structure stored on a computer readable medium that increases computer efficiency held statutory).

Here, Appellants’ Specification discloses that computer program products or computer-readable media are intended to broadly encompass “a carrier wave from the Internet or other network” (Spec. 12, ll. 10-11). Because the scope of Appellants’ claim 27 broadly encompasses signals and other non tangible transmission mediums, we conclude that claim 27 is directed to non statutory subject matter.

DECISION

The decision of the Examiner rejecting claims 1-9, 11, 14, 21, 22, and 24-29 is affirmed.

The decision of the Examiner rejecting dependent claim 23 is reversed.

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b) (effective September 13, 2004, 69 Fed. Reg. 49960 (August 12, 2004), 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)). 37 C.F.R. § 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review." 37 C.F.R. § 41.50(b) also provides that the Appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .

(2) *Request rehearing*. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

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

AFFIRMED-IN-PART - 37 C.F.R. § 41.50(b)

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