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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JU WEI SHI, WEN JIE WANG,
WEI XUE, and BO YANG

Appeal 2017-006433
Application 13/433,442¹
Technology Center 2400

Before THU A. DANG, NORMAN H. BEAMER, and
JOHN D. HAMANN, *Administrative Patent Judges*.

HAMANN, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants file this appeal under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 1–19. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

¹ According to Appellants, the real party in interest is International Business Machines Corporation. App. Br. 3.

THE CLAIMED INVENTION

Appellants' claimed invention "relates to the information processing technology field, and in particular, to a computer processing method and system for network data." Spec. ¶ 1. Claim 1 is illustrative of the subject matter of the appeal and is reproduced below.

1. A computer processing method for network data, comprising:
 - receiving network data;
 - filtering a node with a degree higher than a predefined threshold from the network data;
 - storing the filtered node and its neighborhood relationship;
 - clustering the filtered network data to obtain at least one primary group excluding the filtered node; and
 - obtaining at least one final group by adding the filtered node to the at least one primary group based on the stored neighborhood relationship.

REJECTIONS ON APPEAL

(1) The Examiner rejected claims 1–8 under 35 U.S.C. § 101 as being directed to patent ineligible subject matter.

(2) The Examiner rejected claims 1–4, 6, 7, 10–13, 15, 16, and 19 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Xie et al. (US 2010/0309206 A1; published Dec. 9, 2010) (hereinafter "Xie") and Young et al. (US 7,466,663 B2; issued Dec. 16, 2008) (hereinafter "Young").

(3) The Examiner rejected claims 5 and 14 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Xie, Young, and Zheng et al. (US 2012/0143882 A1; published June 7, 2012) (hereinafter "Zheng").

(4) The Examiner rejected claims 8 and 17 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Xie, Young, and Young et al. (US 2010/0022752 A1; published Jan. 28, 2010) (hereinafter “Young2”).

(5) The Examiner rejected claims 9 and 18 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Xie, Young, and Shao (US 2010/0313205 A1; published Dec. 9, 2010).

ISSUES

The dispositive issues for this appeal are:

- (1) Whether claims 1–8 amount to significantly more than the abstract idea to which they are directed; and
- (2) Whether the combination of Xie and Young teaches or suggests “obtaining at least one final group by adding the filtered node to the at least one primary group based on the stored neighborhood relationship.”

ANALYSIS

We find Appellants’ arguments discussed herein persuasive.

(1) Whether claims 1–8 are significantly more

Appellants contend the Examiner improperly rejected claims 1–8 under 35 U.S.C. § 101.² See App. Br. 8–14; Reply Br. 3–16. Section 101 of the Patent Act provides that “[w]hoever invents or discovers any new and

² Appellants argue the rejected claims 1–8 as a group. Thus, we decide the appeal of the § 101 rejection on the basis of representative claim 1, and refer to the rejected claims collectively herein as “the claims.” See 37 C.F.R. § 41.37(c)(1)(iv); *In re King*, 801 F.2d 1324, 1325 (Fed. Cir. 1986).

useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.” 35 U.S.C. § 101. The Supreme Court has explained that this provision is subject to a long-standing, implicit exception that abstract ideas are not patentable. *Alice Corp. Pty. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2354 (2014). The Court has set forth a two-part inquiry to determine whether this exception applies. The first part is to determine if the claim at issue is directed to an abstract idea. *Alice*, 134 S. Ct. at 2355. Second, if the claim is directed to an abstract idea, we consider the elements of the claim “both individually and as an ordered combination to determine whether the additional elements transform the nature of the claim into a patent-eligible application.” *Alice*, 134 S. Ct. at 2355 (quotation marks omitted) (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 72 (2012)) so as to ensure the claims amount to “significantly more” than the abstract idea. *Alice*, 134 S. Ct. at 2357.

The Examiner finds that the claims are directed to the abstract ideas of receiving, storing, processing, and organizing data, which are fundamental activities of processing information. Final Act. 5. The Examiner further finds that the claims reasonably fall under the broader abstract concepts related to data processing, including (i) organizing information through mathematical correlations; and (ii) collecting data, recognizing certain data within the collected data set, and storing that recognized data in memory. *Id.* (citing *Digitech Image Tech., LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014) and *Content Extraction and Transmission LLC v. Wells Fargo Bank, National Assoc.*, 776 F.3d 1343 (Fed. Cir. 2014)).

We assume *arguendo* for purposes of our analysis below that the claims are directed to one or more abstract ideas. Hence, we examine *Alice*'s second step of whether the claims add significantly more to the abstract ideas found by the Examiner.

The Examiner finds that the claims “do not include additional elements that are sufficient to amount to significantly more than the judicial exception.” Final Act. 5. Rather, the Examiner finds that the claims’ steps “are merely conventional process/steps of collecting data, recognizing certain data within the collected data set, and storing that recognized data in memory, and they are also broad enough that they could be completely performed mentally, verbally, or manually by a person.” Final Act. 5–6; *see also* Ans. 8 (finding the claims are “merely a series of steps describing abstract ideas with no additional elements that are sufficient to amount to significantly more than the judicial exception, and implementing those steps on generic computers was not enough to transform those ideas to a patentable invention”). The Examiner also finds that the claims employ “[g]eneric computers performing generic computer functions to apply an abstract idea do not amount to significantly more than the abstract idea.” Ans. 7–8.

Appellants contend that the claims add significantly more to the abstract idea. App. Br. 12–14; Reply Br. 11–16. Appellants argue the claims “recite[] a computer processing method for network data, comprising receiving network data.” App. Br. 12. According to Appellants, the claims, thus, are “necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks.” App. Br.

13 (quoting *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014)).

Appellants also contend that the claimed subject matter provides significant technological benefits relative to conventional techniques for processing network data. App. Br. 12 (citing Spec. ¶¶ 1–7, 42, Figs. 1, 7) (arguing the claimed subject matter significantly reduces processing time relative to conventional techniques for discovering communities in networks having a large number of nodes); *see also* App. Br. 14 (quoting *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1337 (Fed. Cir. 2016) (“[O]ur conclusion that the claims are directed to an improvement of an existing technology is bolstered by the specification’s teachings that the claimed invention achieves other benefits over conventional databases, such as increased flexibility, faster search times, and smaller memory requirements.”). Appellants further contend that “the plain focus of the claims is on an improvement to computer functionality itself, not on economic or other tasks for which a computer is used in its ordinary capacity.” App. Br. 13 (citing *Enfish*, 822 F.3d at 1336). Appellants also argue that the claims “do not attempt to preempt every application of the idea Rather, they recite a specific way to . . . solve a problem.” App. Br. 14 (quoting *DDR*, 773 F.3d at 1259).

We find the Examiner errs in concluding that the claims do not include an “inventive concept—*i.e.*, an element or combination of elements that is sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.” *Alice*, 134 S. Ct. at 2355 (quotation marks omitted) (quoting *Mayo, Inc.*, 566 U.S. at 72–73). The claims require processing network data (e.g., filtering, storing, clustering, and obtaining groups of node relationships) and are rooted in

computer technology in order to overcome a problem (“time required to process network data to discover communities typically increases exponentially with the number of nodes” (App. Br. 12 (citing Spec. ¶ 3)) specifically arising in the realm of computer networks. Thus, the claims add significantly more to the abstract idea that the Examiner finds. *See DDR*, 773 F.3d at 1257.

Furthermore, the claims are directed to an improvement of an existing technology (i.e., conventional techniques for finding relationships between network nodes), and add significantly more to the abstract idea. Spec. ¶¶ 1–7, Figs. 1, 7; *cf. Enfish*, 822 F.3d at 1336 (Fed. Cir. 2016) (finding that the claims are not directed to an abstract idea, but rather they are directed to a specific improvement to the way computers operate); *id.* at 1339 (finding “an analysis of whether there are arguably concrete improvements in the recited computer technology could take place under step two” of *Alice*). We also note that whether the claims can be implemented on a general-purpose computer is not dispositive, where as here, “the claims . . . are directed to an improvement in the functioning of a computer.” *Enfish*, 822 F.3d at 1338. We also agree with Appellants (Reply Br. 5) that the claims do not raise a preemption concern (i.e., preempting all ways of improving upon determining node relationships), but “rather recite a specific, discrete implementation.” *Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1350 (Fed. Cir. 2016).

Accordingly, we do not sustain the Examiner’s § 101 rejection of claims 1–8.

(2) Whether Xie and Young teach the disputed limitation

Appellants argue that the combination of Xie and Young fails to teach or suggest “obtaining at least one final group by adding the filtered node to the at least one primary group based on the stored neighborhood relationship,” as recited in independent claim 1, and similarly recited in independent claims 10 and 19. App. Br. 15–19; Reply Br. 17–18. More specifically, Appellants argue that both Xie and Young fail to teach or suggest adding the filtered node (i.e., “node with a degree³ higher than a predefined threshold”) in obtaining a final group. App. Br. 15. As to Xie, Appellants argue it teaches that the final groups (i.e., clusters) always exclude the filtered nodes (i.e., hubs). *Id.* (citing Xie ¶¶ 29 (“[A] user can specify that a node is not to be clustered if that node has too many incoming links and/or too many outgoing links.”), 33 (“[E]ach node of each group is evaluated with respect to its number of incoming links . . . , and evaluated with respect to its number of outgoing links If the node exceeds [a] maximum, that node is removed from the group.”), Figs. 3–4)). Appellants also argue that Xie’s paragraphs 36 and 37 “merely state that ‘a clustered node may appear between a source node and a target-of-the target nodes of the clustered node’ and ‘if a source has a sufficient number of links to a target, the links may be represented by a link menu 660 or the like so that each link need not be individually displayed,’” rather than teaching or

³ “Generally, the association extent between nodes in network data is referred to as a degree by a person skilled in the art. For example, if a node V1 is associated with 5 other nodes, it can be considered that the node V1 has a degree of 5 in the network data.” Spec. ¶ 19.

suggesting that primary groups are re-associated with filtered nodes, as the Examiner finds. *See* Reply Br. 17–18 (citing Xie ¶¶ 36–37).

As to Young, Appellants argue it teaches or suggests “a technique in which each of the nodes (including the hubs) is randomly assigned to one of twenty different clusters, and then one or more of the nodes are randomly reassigned to different clusters.” Reply Br. 18 (citing Young 13:58–15:11, Fig. 13). Appellants contend that the combined teachings still provide “no teaching or suggestion of the technique recited in claim 1, in which hubs are initially excluded from clusters but later included.” *Id.*

The Examiner finds that the combination of Xie and Young teaches or suggests the disputed limitation. Ans. 17–19. More specifically, the Examiner finds that Xie teaches excluding nodes whose degree exceeds a predefined parameter from the list of nodes to be clustered into primary groups. Ans. 17 (citing Xie ¶¶ 5–7, 20, 29–33, Figs. 1, 4). The Examiner finds that Xie also teaches or suggests these “primary groups are re-associated with the corresponding filtered or hub nodes.” Ans. 18 (citing Xie Figs. 5–6, ¶¶ 36–37). As to Young, the Examiner finds it teaches or suggests “forming/obtaining final groups by adding the selected/filtered nodes to [a] most appropriate one of a plurality of cluster of nodes based on cost value which is calculated as the function of neighborhood relationships/links [i.e. degree].” Ans. 17–18 (citing Young Fig. 13, 13:58–61, 14:1–38, 15:7–11).

We are persuaded by Appellants’ arguments. The portions of Xie and Young cited by the Examiner fail to teach or suggest the disputed limitation. Contrary to the Examiner’s findings, the cited portions of Xie do not teach or suggest that primary groups are re-associated with filtered nodes. Rather,

the portions of Xie the Examiner cites for this teaching instead teach combining links (e.g., a link menu) when there are a sufficient number of links between a source node and target node, as well as how clustered nodes appear between source nodes and target nodes. Xie ¶¶ 36–37, Figs. 5–6. Likewise, the portions of Young cited by the Examiner fail to teach or suggest obtaining final groups by adding a filtered node to a cluster of nodes (i.e., a primary group) based on the stored neighborhood relationship. Rather, these portions instead teach or suggest randomly assigning filtered nodes to groups based on a cost analysis rather than based on the stored neighborhood relationship. Young Fig. 13, 13:58–61, 14:1–38, 15:7–11.

Accordingly, we do not sustain the Examiner’s § 103 rejection of independent claims 1, 10, and 19, as well as claims 2–4, 6, 7, 11–13, 15, and 16, as they depend, directly or indirectly from one of these independent claims. We also do not sustain the Examiner’s (i) § 103 rejection of claims 5 and 14; (ii) § 103 rejection of claims 8 and 17; and (iii) § 103 rejection of claims 9 and 18, as each of these claims depend, directly or indirectly, from one of the independent claims.

DECISION

We reverse the Examiner’s decision rejecting claims 1–19.

REVERSED