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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CYRIL PLISKO, ALEXANDER GOLDBERG, and LEON KULL[1]

Appeal 2018-006515
Application 14/088,401
Technology Center 2100

Before JAMES R. HUGHES, ERIC S. FRAHM, and MATTHEW J. McNEILL, *Administrative Patent Judges*.

HUGHES, *Administrative Patent Judge*.

DECISION ON APPEAL

[1] Infinidat Ltd. ("Appellant") is the applicant, under 37 C.F.R. § 1.46 (*see* Application Data Sheet filed March 13, 2014), and is identified as the real party in interest. App. Br. 1.

STATEMENT OF THE CASE

Appellant seeks our review under 35 U.S.C. § 134(a) of the Examiner's decision rejecting claims 1–21. App. Br. 1; Non-Final Act. 3–15.[2] We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

Appellant's Invention

Appellant's invention addresses "a need to allow users to perform a snapshot comparison [of file system objects] in cases where such users do not have access to comparing utilities provided by the local operating system or by the underlying file system." Spec. ¶ 12. The invention enables an end user to compare snapshots in a file system by using standard file system commands "(e.g., read data from a file, read attributes of directories, etc.) that are usually used for accessing objects (files or directories) of the file system," such that the end user is not required to have system administrator access rights to a special management interface. *Id.* ¶ 55. Specifically, the end user "can user a standard end-user file system command that includes two identifiers of two snapshots to be compared, embedded within the command, e.g. as a virtual directory path." *Id.* ¶ 56.

[2] We refer to Appellant's Specification ("Spec.") filed Nov. 24, 2013; Appeal Brief ("App. Br.") filed Dec. 9, 2017; and Reply Br. ("Reply Br.") filed June 7, 2018. We also refer to the Examiner's Non-Final Office Action ("Non-Final Act.") dated Sept. 19, 2017; and Answer ("Ans.") dated Apr. 9, 2018.

Representative Claim

Independent claim 1, reproduced below, is illustrative of the claimed subject matter:

> 1. A method for performing a comparison between first and second points in time snapshots of a file system entity, the method comprises:
>
> receiving by a storage system a command that was sent from a host computer, the command is network file system protocol compliant, wherein the command comprises (i) an operation code, and (ii) information about a virtual path, the virtual path that comprises (ii.a) first fields that comprise snapshot comparison parameters indicative of the first and second points in time snapshots of the file system entity, and (ii.b) a second field of a content that indicates that the command is a request to compare between the first and second points in time snapshots of the file system entity;
>
> identifying, by a file system application hosted by the storage system and in response to the content of the second field of the virtual path, the command as including a request to compare between the first and second points in time snapshots of the file system entity;
>
> comparing by the file system application the first and second points in time snapshots of the file system entity to provide a comparison result that is network file system protocol compliant; and
>
> sending by the storage system the comparison result to the host computer.

Rejections on Appeal

Claims 1–21 stand rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter.

Claims 1–21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Christopher et al. (US 2015/0081994 A1; Mar. 19, 2015) and Bhat et al. (US 2013/0054888 A1; Feb. 28, 2013).

ANALYSIS

The Patent-Ineligible Subject Matter Rejection

Under 35 U.S.C. § 101, a patent may be obtained for "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." The Supreme Court has "long held that this provision contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014) (quoting *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589 (2013)).

The Supreme Court, in *Alice*, reiterated the two-step framework previously set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66, 77–80 (2012), "for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts." *Alice*, 573 U.S. at 217. Assuming that a claim nominally falls within one of the statutory categories of machine, manufacture, process, or composition of matter, the first step in the analysis is to "determine whether the claims at issue are directed to one of those patent-ineligible concepts" (*id.*), e.g., to an abstract idea. *See Alice*, 573 U.S. at 219 ("On their face, the claims before us are drawn to the concept of intermediated settlement, i.e., the use of a third party to mitigate settlement risk."); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) ("Claims 1 and 4 in petitioners' application explain the basic concept

of hedging, or protecting against risk."). Concepts determined to be abstract ideas, and thus patent ineligible include, but are not limited to, certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. at 594–95); and mental processes (*Gottschalk v. Benson*, 409 U.S. at 67). Concepts determined to be patent eligible include physical and chemical processes, such as "molding rubber products" (*Diamond v. Diehr*, 450 U.S. at 191); "tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores" (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1853))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that "[a] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula." *Diehr*, 450 U.S. at 176; *see also id.* at 191 ("We view respondents' claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula."). The Supreme Court continued by qualifying its findings, indicating that a claim "seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, . . . and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment." *Id.* (citing *Benson* and *Flook*); *see, e.g.*, *id.* at 187 ("It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.").

If the claims are not directed to an abstract idea, the inquiry ends. Otherwise, the inquiry proceeds to the second step of the *Alice* and *Mayo* framework where the elements of the claims are considered "individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application." *Alice*, 573 U.S. at 217 (quoting *Mayo*, 566 U.S. at 78–79). This second step is described as "a search for an 'inventive concept'—*i.e.*, an element or combination of elements that is '. . . significantly more than . . . the [ineligible concept] itself.'" *Id.* at 217–218 (alteration in original) (quoting *Mayo*, 566 U.S. at 72–73). "A claim that recites an abstract idea must include 'additional features' to ensure 'that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].'" *Alice*, 573 U.S. at 221 (quoting *Mayo*, 566 U.S. at 77). "[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention." *Id.*

The Court acknowledged in *Mayo* that "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas." *Mayo*, 566 U.S. at 71. We, therefore, look to whether the claims focus on a specific means or method that improves the relevant technology or are instead directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery. *See Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1336 (Fed. Cir. 2016).

The PTO recently published revised guidance on the application of § 101. USPTO's *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) (hereinafter "Revised Guidance"). Under that guidance, after determining that a claim falls within one of the statutory

categories under § 101 (hereinafter "Step 1"), we first look to whether the claim recites:

(1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activities such as a fundamental economic practice, or mental processes) (hereinafter "Step 2A, prong 1"); and

(2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h)) (hereinafter "Step 2A, prong 2").

Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look to whether the claim:

(3) adds a specific limitation beyond the judicial exception that is not "well-understood, routine, conventional" in the field (*see* MPEP § 2106.05(d)); or

(4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.[3]

See Revised Guidance.

Revised Guidance Steps 1 and 2A, Prong 1

Under Revised Guidance Step 1, we find claim 1 recites "[a] method for performing a comparison between first and second points in time

[3] Items (3) and (4) are collectively referred to as "Step 2B" hereinafter and in the Revised Guidance.

snapshots of a file system entity" that includes a number of steps, i.e., a process. A process is a statutory category of invention under §101.

Next, under Revised Guidance Step 2A, Prong 1, we determine whether claim 1 recites a judicial exception, e.g., an abstract idea. The Examiner concludes claim 1 is directed to an abstract idea (Non-Final Act. 4–5), specifically, a process that "is simply the mere aggregation and comparison of snapshot data in order to derive a desired output of comparison results, 'i.e., the mere aggregation and manipulation of data'" that "is similar to other ideas found to be abstract by various courts." Ans. 5.

Appellant contends claim 1 "does not describe only the 'desirable result' . . . but rather recite[s] a specific solution, where a command, which is network file system protocol compliant and received by the storage system from the host computer, can embed the information required for specific snapshot comparison requests, within the path of the command." App. Br. 12–13. In other words, claim 1 "improves the way that a storage system and a host computer communicate snapshot comparison request and response, using only network file system protocol." Reply Br. 2. We are persuaded of Examiner error.

Claim 1 recites "receiving by a storage system a command that was sent from a host computer, the command is network file system protocol compliant"; "identifying, by a file system application hosted by the storage system . . . the command as including a request to compare between the first and second points in time snapshots of the file system entity"; "comparing by the file system application the first and second points in time snapshots of the file system entity to provide a comparison result that is network file

system protocol compliant"; and "sending by the storage system the comparison result to the host computer." As can be seen, claim 1 does not recite "the mere aggregation and manipulation of data" (Ans. 5), but rather relates to sending a file system command from a host computer to a storage system, performing a comparison operation of snapshots of a file system entity based on the command, and sending the comparison result to the host computer. That is, the claimed steps all relate to a comparison operation of snapshots of a file system entity by a file system application, rather than data manipulation, or even data comparison, in an abstract sense.

Claim 1 does not recite mathematical concepts, because there are no mathematical relationships, formulas, equations, or calculations analyzed or performed in the claim. Claim 1 also does not recite mental processes, because using a file system command to perform a comparison operation on snapshots of a file system entity is not something that can be practically performed in the human mind—this operation exists exclusively in the realm of computers. Finally, claim 1 does not recite any of the methods of organizing human activity identified in the Revised Guidance. That is, claim 1 relates to performing a comparison operation by a file system application, not fundamental economic principles or practices, commercial or legal interactions, or managing personal behavior or relationships or interactions between people. *See* Revised Guidance. Accordingly, we determine claim 1 does not recite an abstract idea because none of the limitations fall within the enumerated categories of abstract ideas under the Revised Guidance.

Revised Guidance Step 2A, Prong 2

Although we determine that claim 1 does not recite an abstract idea, for completeness, we next consider whether claim 1 integrates any possible abstract ideas into a practical application under Revised Guidance Step 2A, Prong 2. We determine that claim 1 does contain a practical application.

Appellant's Specification identifies a problem where "a user accesses a filesystem hosted by a file-server or a storage system implementing a file-server" but "the network file system (NAS) protocol used for interfacing such filesystem does not support using a snapshot comparison command and therefore, even if the file-server includes a snapshot comparison utility, the access to the snapshot comparison utility is not available for the end-user." Spec. ¶ 13. Thus, "[t]here is a need to allow users to perform a snapshot comparison in cases where such users do not have access to comparing utilities provided by the local operating system or by the underlying file system." *Id.* ¶ 12. Appellant's invention addresses this need by leveraging the relevant network file system protocol to send a command with a virtual path understood by a file system application on a storage system to be a comparison command for comparing particular snapshots of a file system entity. The Specification provides the following exemplary solution:

> The end-user file system command that can be used for the snapshot comparison may be a command that is usually used for reading/displaying the content of a file (e.g., 'type' or 'copy' in Windows shell, 'cat' in UNIX/Linux) but other commands can be used as well . . . . If a command for displaying file content is utilized, e.g. 'cat'-command of UNIX, the line-command can be used with the following format:
>
> cat /snapcomp/snap1/snap2

> Where 'snapcomp' is a virtual directory and its name (e.g. snapcomp) is a reserved name that indicates that the purpose of the command is not to read a file but to perform a snapshot comparison between the two indicated sub-directories snap1 and snap2 . . . .

Id. ¶¶ 56–57.

Claim 1 incorporates the described solution by reciting the details of using a "network file system protocol compliant" command to perform a comparison operation by a "file system application hosted by the storage system." In particular, claim 1 defines the data structure of the command, which includes "(i) an operation code, and (ii) information about a virtual path, the virtual path that comprises (ii.a) first fields that comprise snapshot comparison parameters indicative of the first and second points in time snapshots of the file system entity, and (ii.b) a second field of a content that indicates that the command is a request to compare between the first and second points in time snapshots of the files system entity." This data structure allows an end user to initiate a comparison operation by a file system application that would otherwise be unavailable to the user. *See id.* ¶¶ 12, 13, 56–57. Thus, claim 1 recites a specific solution that improves the functionality of file system applications hosted by networked storage systems. Claim 1, therefore, integrates any possible abstract ideas into a practical application. *See* Revised Guidance; MPEP § 2106.05(a) ("It was the specification's discussion of the prior art and how the invention improved the way the computer stores and retrieves data in memory in combination with the specific data structure recited in the claims that demonstrated eligibility.") (citing *Enfish*, 822 F.3d. at 1339).

Accordingly, we determine claim 1 does not recite an abstract idea, and in any case, contains a practical application. We do not, therefore, reach Step 2 under the Revised Guidance. We thus do not sustain the Examiner's § 101 rejection of independent claim 1, independent claims 8 and 15 which recite commensurate limitations, and dependent claims 2–7, 9–14, and 16–21.

The Obviousness Rejection

The Examiner finds the combination of Christopher and Bhat discloses all the limitations of claim 1, including that Christopher teaches "the command comprises (i) an operation code, and (ii) information about a virtual path, the virtual path that comprises (ii.a) first fields that comprise snapshot comparison parameters indicative of the first and second points in time snapshots of the file system entity, and (ii.b) a second field of a content that indicates that the command is a request to compare between the first and second points in time snapshots of the file system entity." Non-Final Act. 6–12.

Appellant contends, among other things, that Christopher fails to teach the details of the claimed command. *See* App. Br. 17–18. We are persuaded of Examiner error.

Christopher describes "methods, systems, and computer programs for tracking changes of virtual devices, and making incremental backups using the tracked changes." Christopher ¶ 18. In an embodiment, a "[v]irtualized computer architecture **100** includes one or more hosts **102** connected to a storage system **104**, for example, through a network." *Id.* ¶ 19. "[A] hypervisor **106** is installed on top of hardware platform **108** [in the host 102]

and supports a virtual machine execution space **114**." *Id.* ¶ 20, Fig 1. In order to connect to the storage system,

> SCSI virtualization layer **132** of hypervisor **106** receives a data transfer and control operation (in the form of SCSI commands, for example intended for a SCSI-compliant virtual disk) . . . and converts them into file system operations that are understood by virtual machine file system (VMFS) **134** in order to access a file stored in one or more logical unit numbers (LUNs) in storage system **104**.

Id. ¶ 21. Further, the:

> VMFS **134** may include a virtual disk layer **140** that provides applications with access to virtual disk storage. Virtual disk layer **140**, in response to requests from applications via an application programming interface (API), may create virtual machine disk files (e.g., .vmdk files), provide read and write access to a virtual disk, and create snapshots of virtual disks.

Id. ¶ 24. The "virtual disk layer **140** may be configured to quickly and efficiently compare a snapshot **148** to a parent disk," where the "features of snapshots and comparing snapshots are used, for example, to facilitate incremental backups." *Id.* ¶ 38.

Thus, as shown above, Christopher describes a virtualized computer architecture where SCSI commands may be used to perform file system operations on a SCSI-compliant virtual disk, where file system operations include taking and comparing snapshots. The Examiner has not, however, shown that Christopher teaches a SCSI command for comparing snapshots with the particular data structure recited in claim 1, specifically, "(i) an operation code, and (ii) information about a virtual path, the virtual path that comprises (ii.a) first fields that comprise snapshot comparison parameters indicative of the first and second points in time snapshots of the file system

entity, and (ii.b) a second field of a content that indicates that the command is a request to compare between the first and second points in time snapshots of the file system entity."

Accordingly, we do not sustain the Examiner's § 103(a) rejection of independent claim 1, independent claims 8 and 15 which recite commensurate limitations, and dependent claims 2–7, 9–14, and 16–21.

CONCLUSIONS

Under 35 U.S.C. § 101, Appellant has shown the Examiner erred in rejecting claims 1–21.

Under 35 U.S.C. § 103(a), Appellant has shown the Examiner erred in rejecting claims 1–21.

DECISION

We reverse the Examiner's decision to reject claims 1–21.

REVERSED