UNITED STATES PATENT AND TRADEMARK OFFICE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte YANIV ROMEM, OMRI MANN,
and OFER OSHRI

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Appeal 2019-002879
Application 14/724,971
Technology Center 2400

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Before JAMES R. HUGHES, JOYCE CRAIG, and
MATTHEW J. McNEILL, *Administrative Patent Judges*.

CRAIG, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1–27. *See* Non-Final Act. 1. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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[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 EXCELERO. Appeal Br. 3.

CLAIMED SUBJECT MATTER

The claims are directed "to accessing a remote storage and particularly to accessing a remote storage by sending commands over a remote direct memory access." Spec. ¶ 2. Claim 22, reproduced below, is illustrative of the claimed subject matter:

22.   A user's client device configured to access a plurality of remote storage devices through a controller, the plurality of remote storage devices communicatively coupled to the controller, the user's client device comprising:

a processing unit;

a first network interface for communicating with the controller;

a second interface for communicating with a plurality of remote storage devices; and

a memory communicatively coupled to the processing unit and containing first instructions, in response to the first instructions being executed by the processing unit, the user's client device is configured to:

send from the user's client device a request for storage block mapping to the controller; and

receive at the user's client device a map from the controller, the map comprising a plurality of virtual addresses, each virtual address corresponding to a physical address of a data block on a storage device of the plurality of remote storage devices, and

wherein the user's client device is configured to directly access the data block by mapping the virtual address to the physical address of the data block.

REJECTIONS

Claims 1–27 stand rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter. Non-Final Act. 2–12.

Claims 1–27 stand rejected under 35 U.S.C. § 102(a)(1) as anticipated by Hayden et al. (US 8,407,448 B1, issued Mar. 26, 2013) ("Hayden"). Non-Final Act. 12–18.

ANALYSIS

Rejection of Claims 1–27 Under 35 U.S.C. § 101[2]

Appellant argues that the Examiner's rejection of claims 1–27 under 35 U.S.C. § 101 as directed to patent-ineligible subject matter is in error. Appeal Br. 14–28. To the extent Appellant has not advanced separate, substantive arguments for particular claims, or other issues, such arguments are waived. 37 C.F.R. § 41.37(c)(1)(iv) (2018). Appellant argues claims 1–27 as a group. *See* Appeal Br. 14–28. Given our discretion under 37 C.F.R. § 41.37(c)(1)(iv), we decide the § 101 rejection of claims 1–27 based on representative claim 22.

Principles of Law

"Whether a claim is drawn to patent-eligible subject matter is an issue of law that we review de novo." *SiRF Tech., Inc. v. Int'l Trade Comm'n*, 601 F.3d 1319, 1331 (Fed. Cir. 2010).

An invention is patent-eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. However, the U.S. Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: "[l]aws of nature, natural phenomena, and

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[2] We note that the Examiner has withdrawn the patent-eligibility rejection insofar as it was based on the claims being directed to "carrier wave" embodiments. *See* Ans. 3. The Examiner has maintained, however, the patent-eligibility rejection on the basis of the claims being directed to an abstract idea without significantly more. *See* Ans. 3–7.

abstract ideas" are not patentable. *E.g.*, *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014).

In determining whether a claim falls within an excluded category, we are guided by the Court's two-part framework, described in *Mayo* and *Alice*. *Id.* at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is "directed to." *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 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. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as "molding rubber products" (*Diamond v. Diehr*, 450 U.S. 175, 191 (1981)); "tanning, dyeing, making waterproof 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 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 187; *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."). Having said that, the Court also indicated 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.* (citation omitted) (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 claim is "directed to" an abstract idea, we turn to the second part of the *Alice* and *Mayo* framework, where "we must examine the elements of the claim to determine whether it contains an 'inventive concept' sufficient to 'transform' the claimed abstract idea into a patent-eligible application." *Alice*, 573 U.S. at 221 (quotation marks omitted). "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].'" *Id.* (alterations in original) (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.*

In January 2019, the U.S. Patent and Trademark Office ("USPTO") published revised guidance on the application of § 101. 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019), now

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incorporated in the Manual of Patent Examination Procedure ("MPEP") in

sections 2103 through 2106.07(c) ("2019 Revised Guidance").[3]

    Under the 2019 Revised Guidance and the October 2019 Update, 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 activity such as a fundamental economic practice, or mental
> processes) ("Step 2A, Prong One"); and

> (2) additional elements that integrate the judicial exception into a
> practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h) (9th ed.
> Rev. 08.2017, Jan. 2018)) ("Step 2A, Prong Two").[4]

2019 Revised Guidance, 84 Fed. Reg. at 52–55.

    Only if a claim (1) recites a judicial exception and (2) does not

integrate that exception into a practical application, do we then look, under

Step 2B, 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

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[3] In response to received public comments, the Office issued further guidance on October 17, 2019, clarifying the 2019 Revised Guidance. USPTO, *October 2019 Update: Subject Matter Eligibility* (the "October 2019 Update") (available at https://www.uspto.gov/sites/default/files/documents/peg_oct_2019_update.pdf).

[4] This evaluation is performed by (a) identifying whether there are any additional elements recited in the claim beyond the judicial exception, and (b) evaluating those additional elements individually and in combination to determine whether the claim as a whole integrates the exception into a practical application. *See* 2019 Revised Guidance - Section III(A)(2), 84 Fed. Reg. 54–55.

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

2019 Revised Guidance, 84 Fed. Reg. at 52–56; MPEP § 2106.04.

Step 1

Claim 22 relates to "[a] user's client device," which at least falls within the machine category of § 101. *See* 2019 Revised Guidance, 84 Fed. Reg. at 53–54 (citing MPEP §§ 2106.03, 2106.06).

Step 2A(i): Does the Claim Recite a Judicial Exception?

The Examiner determined that the claims recite the abstract idea of "virtual to real address mapping." Ans. 5; Non-Final Act. 2. The Examiner analogized this abstract idea to "asking for a telephone book so a caller can convert a name to a phone number or street address in order to make a direct call without the aid of an operator." Ans. 5.

Appellant argues that the claims do not fall within any of the three main categories of abstract ideas identified in the 2019 Revised Guidance. Reply Br. 2. Appellant also argues that "[t]he Examiner does **not** take the claim **as a whole**. Rather the Examiner is looking at the claim elements *individually* and in particular to see if such elements *contain* or *mention* an abstract concept." Appeal Br. 18–19.

We are not persuaded that the Examiner erred in determining that claim 22 recites an abstract idea. Claim 22 recites "send . . . a request for storage block mapping," "receive . . . a map . . . , the map comprising a plurality of virtual addresses, each virtual address corresponding to a physical address of a data block," and "mapping the virtual address to the physical address of the data block." These limitations cover requesting and

receiving a mapping, and using the mapping to determine a correspondence between a virtual address and a physical address. The Examiner correctly recognizes that this mapping is similar to looking up a phone number or address based on a person's name (*see* Ans. 5)—i.e., a mental process. Accordingly, the claimed mapping can be fairly categorized within the mental processes category of abstract ideas, in particular, an evaluation. *See* 2019 Revised Guidance, 84 Fed. Reg. at 52. This conclusion is supported by Federal Circuit precedent holding that a mapping or translation that can be performed mentally is a patent-ineligible abstract idea. *See, e.g.*, *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1139 (Fed. Cir. 2016) (claims were directed to abstract idea of "translating a functional description of a logic circuit into a hardware component description of the logic circuit," which could be "performed mentally or by pencil and paper").

Appellant's argument that the Examiner is looking at individual claim elements, rather than the claim as a whole (Appeal Br. 18–19), is unavailing. Under the 2019 Revised Guidance, we first look to see whether a claim recites an abstract idea. 2019 Revised Guidance, 84 Fed. Reg. at 54. Then we look to see whether any additional elements in the claim integrate any recited abstract idea into a practical application. *Id.* As discussed above, we determine that claim 22 recites an abstract idea in the mental processes category. We address the additional elements of claim 22 below to determine "whether the claim as a whole integrates the recited judicial exception into a practical application of the exception." *Id.*

Because we agree with the Examiner that claim 22 recites an abstract idea, we proceed to Prong Two of Step 2A to determine if the idea is

integrated into a practical application, in which case the claim as a whole would not be "directed to" merely an abstract idea.

Step 2A(ii): Judicial Exception Integrated into a Practical Application?

We determine whether the recited judicial exception is integrated into a practical application of that exception by: (a) identifying whether there are any additional elements recited in the claim beyond the judicial exception(s); and (b) evaluating those additional elements, along with the limitations that recite a judicial exception, individually and in combination to determine whether they integrate the exception into a practical application.

We use the term "additional elements" for claim features, limitations, or steps that the claim recites beyond the identified judicial exception. *See* Revised Guidance at 55 n.24. In claim 22, the additional elements include the limitations "user's client device," "remote storage devices," "controller," "processing unit," "first network interface for communicating with the controller," "second interface for communicating with a plurality of remote storage devices," "memory communicatively coupled to the processing unit," and "wherein the user's client device is configured to directly access the data block."

To integrate the exception into a practical application, the additional claim elements must, for example, improve the functioning of a computer or any other technology or technical field (*see* MPEP § 2106.05(a)), apply the judicial exception with a particular machine (*see* MPEP § 2106.05(b)), affect a transformation or reduction of a particular article to a different state or thing (*see* MPEP § 2106.05(c)), or apply or use the judicial exception in some other meaningful way beyond generally linking the use of the judicial

exception to a particular technological environment (*see* MPEP
§ 2106.05(e)). *See* 2019 Revised Guidance.

Here, the "user's client device," "remote storage devices,"
"controller," "processing unit," "first network interface," "second
interface," and "memory" limitations are all generic computer components
that amount to implementing the abstract idea in a generic computing
environment. The Specification confirms the generic nature of these
limitations. *See, e.g.*, Spec. ¶¶ 42, 43, 45, 46, 49, 51, 53, 57. These
limitations, therefore, do not meaningfully limit the abstract idea beyond
generally linking the abstract idea to a particular technological environment,
and thus do not integrate the abstract idea into a practical application. *See
Alice*, 573 U.S. at 221 ("[M]erely requir[ing] generic computer
implementation[] fail[s] to transform that abstract idea into a patent-eligible
invention."); MPEP § 2106.05(e).

Further, the "directly access the data block" limitation is merely an
instruction to apply the abstract idea, and thus also fails to meaningfully
limit the abstract idea. In other words, the "directly access" limitation uses
the result of the mapping to perform the data access, but does not use a
particular machine or any improved technology for actually accessing
physical memory—i.e., it is a generic data access limitation. This generic
data access limitation does not lend patent-eligibility to the otherwise
ineligible abstract idea of performing a mapping to determine the physical
address to be used in the data access. *See Alice*, 573 U.S. at 221 ("[A]
patent-eligible application requires 'more than simply stat[ing] the [abstract
idea] while adding the words "apply it."'"); MPEP § 2106.05(f).

Appellant argues that the claims "are focused on specific means or methods" and "**not** an effect or result." Appeal Br. 15 (citing *Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1337 (Fed. Cir. 2017)). Appellant also argues that the claims "are directed to **a specific improvement to the way computers operate**, in particular a user's client device and the way it accesses storage over the network, thereby improving the user experience." *Id.* at 16; *see also id.* at 17. Further, Appellant argues that

> [t]he claims are directed to a *particular solution* for providing a user's client device, which is communicatively connected to a controller, access to a plurality of remote storage devices communicatively connected to the controller and to the user's client device. Thus, the claims provide a **particular method** for providing a device access to remote storage.

Id. at 16.

We disagree with Appellant that claim 22 is directed to specific means, a specific improvement, or particular method in the way a device accesses remote storage. As stated above, claim 22 recites generic computer components to perform a generic data access. The fact that "the user's client device is configured to directly access the data block *by mapping the virtual address to the physical address of the data block*" in claim 22 does not change the analysis. The mapping is the abstract idea, as discussed above, and cannot be relied upon to confer patent-eligibility. Claim 22 simply uses the information obtained from the mapping to perform a generic data access with generic computer components. Nothing about the claimed generic computer components, either individually or in combination, "leads to an

improvement in the *functioning* of the system." *Two-Way Media*, 874 F.3d at 1338.

In the Reply Brief, Appellant argues that "the individual claim elements are 'integrated into a practical application' in that any calculation/determination is **not** the end result but rather is used for subsequent steps given that the claim produces a map . . . the map being sent to the user's client device . . . to be used in accessing remote data." Reply Br. 2–3.

We disagree that using the claimed map to access data integrates the abstract idea into a practical application. Claim 22 does not specify that using the claimed map somehow changes or improves how data is accessed from the remote storage. Rather, as mentioned above, the data access function is recited generically and performed by generic computer components. Such generic computer operations, without more, do not render the abstract idea patent-eligible.

Appellant argues that "improvements to virtual memory systems and various arrangements that involve conversion between real and virtual addresses are directed to patentable subject matter, in an analogous way that the curing rubber arrangement of *Diamond v. Diehr*, (450 U.S. 175) was directed to patentable subject matter even though it made use of a mathematical equation." Appeal Br. 17; *see also* Reply Br. 3.

This argument is not persuasive because claim 22 does not recite an improvement to a virtual memory system. That the claimed "map compris[es] a plurality of virtual addresses, each virtual address corresponding to a physical address of a data block on a storage device of the plurality of remote storage devices" does not constitute an improvement

to a virtual memory system. Rather, this limitation covers the abstract idea itself of mapping between virtual and physical addresses. There are no claimed "rules with specific characteristics," *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1313 (Fed. Cir. 2016), that define the mapping as a specific improvement to a virtual memory system. *See Two-Way Media*, 874 F.3d at 1339 (holding a claim patent-ineligible where the claim "refer[red] to certain data 'complying with the specifications of a network communication protocol' and the data being routed in response to one or more signals from a user, without specifying the rules forming the communication protocol or specifying parameters for the user signals.").

Moreover, claim 22 is unlike the patent-eligible claims in *Diehr*, which recited the use of a mathematical formula and programmed digital computer in a process for curing synthetic rubber. 450 U.S. at 177. In *Diehr*, the claimed process "constantly recalculat[ed] the appropriate cure time through the use of the formula and a digital computer, and automatically open[ed] the press at the proper time." *Id.* at 187. In other words, the process of curing synthetic rubber was improved by "significantly lessen[ing] the possibility of 'overcuring' or 'undercuring.'" Here, the mapping in claim 22 results in a physical address, which is then used the same way any physical address is used for a generic data access, without any improvement to how data is accessed. *See, e.g.*, Spec. ¶ 47 ("Each of the virtual addresses corresponds to a physical address of a data block on one of the storage devices 160. The physical addresses may be on one or more of the storage devices 160.").

Finally, Appellant argues that the claims do not preempt an abstract idea, and therefore, are not directed to an abstract idea. Appeal Br. 19–23.

We are not persuaded by Appellant's preemption argument because "preemption concerns are fully addressed and made moot" when a claim is deemed patent-ineligible under the *Alice* framework (*Two-Way Media*, 874 F.3d at 1339), as is the case here, based on our analysis above, and continued below.

Considering claim 22 as a whole, we determine that claim 22 does not recite (i) an improvement to the functionality of a computer or other technology or technical field; (ii) a "particular machine" to apply or use the judicial exception; (iii) a particular transformation of an article to a different thing or state; or (iv) any other meaningful limitation. *See* 84 Fed. Reg. at 55. Rather, claim 22 recites an abstract idea as identified in Step 2A(i), *supra*, and none of the limitations integrates the judicial exception into a practical application.

Therefore, because the abstract idea is not integrated into a practical application, we conclude that claim 22 is directed to the judicial exception.

Step 2B — "Inventive Concept" or "Significantly More"

If the claims are directed to a patent-ineligible concept, as we conclude above, we proceed to the "inventive concept" step. For Step 2B we must "look with more specificity at what the claim elements add, in order to determine 'whether they identify an "inventive concept" in the application of the ineligible subject matter' to which the claim is directed." *Affinity Labs of Texas, LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1258 (Fed. Cir. 2016) (quoting *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350 (Fed. Cir. 2016)). We look to see whether there are any "additional features" in the claims that constitute an "inventive concept," thereby rendering the claims eligible for patenting even if they are directed to an abstract idea. *Alice*, 573

U.S. at 221. Those "additional features" must be more than "well-understood, routine, conventional activity." *Mayo*, 566 U.S. at 79.

The Examiner determined that the additional elements in claim 1 "are nothing more than generic general purpose component(s) and function(s) . . . which are well understood, routine, and conventional activities previously known in the industry; which, when analyzed as a whole . . . adds nothing significant . . . ." Non-Final Act. 2–3.

Appellant argues that "the claims are directed to resolving a particular Internet-centric problem, e.g., how to access remote storage in a satisfactory manner, and so the claims also embody an inventive concept." Appeal Br. 15. Appellant further argues that "[t]he instant claims are directed [to] a **particular, practical application** of virtual addressing that is **<u>not</u>** conventional." *Id.* at 16.

We are not persuaded by Appellant's arguments because claim 22 simply uses the result of performing the abstract idea—a physical address— to perform a conventional data access function. Appellant does not direct our attention to anything in the Specification that indicates the computer components perform anything other than well-understood, routine, and conventional functions, such as sending data, receiving data, comparing data, or retrieving stored data. *See buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350, 1355 (Fed. Cir. 2014) ("That a computer receives and sends the information over a network—with no further specification—is not even arguably inventive"); *In re TLI Commc'ns LLC Patent Litig.*, 823 F.3d 607, 614 (Fed. Cir. 2016) (server that receives data, extracts classification information from the received data, and stores the digital images insufficient

to add an inventive concept); *Alice*, 573 U.S. at 225–26 (receiving, storing, sending information over networks insufficient to add an inventive concept).

The Specification describes the additional elements as conventional computer components in general terms, without describing the particulars, for example: "[t]he client device may be a personal computer (PC), a laptop, a smartphone, a smart watch, a tablet computer, and the like" (Spec. ¶ 46); "remote storage device 160 may be a solid state drive (SSD), a hard disk drive (HDD), or a hybrid storage drive (HSD)" (Spec. ¶ 43); "[t]he first network interface may be an RDMA interface" which "may be implemented, in exemplary embodiments as iWARP, RDAM over Converged Ethernet (RoCE), and Infiniband" (Spec. ¶ 51); "[t]he second interface 304 may be, for example, NVM Express" (Spec. ¶ 49). We, therefore, conclude that the additional limitations may be broadly but reasonably construed as reciting conventional computer components and techniques, particularly in light of Appellant's Specification, as cited above. *See Berkheimer Memo*[5] § III.A.1.

We conclude claim 22 does not have an inventive concept because the claim, in essence, merely recites various computer-based elements along with no more than mere instructions to implement the identified abstract idea using the computer-based elements.

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[5] "Changes in Examination Procedure Pertaining to Subject Matter Eligibility, Recent Subject Matter Eligibility Decision (*Berkheimer v. HP, Inc.*)" at 3 (Apr. 19, 2018) (explaining that a specification that describes additional elements "in a manner that indicates that the additional elements are sufficiently well-known that the specification does not need to describe the particulars of such additional elements to satisfy 35 U.S.C. § 112(a)" can show that the elements are well understood, routine, and conventional).

Because the claims are directed to a judicial exception, without significantly more, we sustain the Examiner's § 101 rejection of independent claim 22 and grouped claims 1–21 and 23–27.

Rejection of Claims 1–27 Under 35 U.S.C. § 102

Claims 1, 6–9, 13–16, 20–22, 26, and 27

The Examiner finds that Hayden teaches all the limitations of independent claim 22, including that either of Hayden's Figures 1 or 2 shows a "user's client device." *See* Non-Final Act. 13. Specifically, with reference to Hayden's Figure 1, the Examiner finds that "the user's client device also includes not only the 'USER' hardware but also software components 1,2,3,4, and 11." Ans. 7. Appellant argues that "the client mentioned in Hayden is actually called 'a client of the storage server', e.g., in column 2, line 26, which is very different from a ***user's*** client ***device*** as recited in the claims." Appeal Br. 29. Appellants' arguments are not persuasive of Examiner error.

Hayden teaches "a system for performing an I/O in a storage virtualization environment consisting of a storage server, a data storage system, and a client of the storage server." Hayden, 2:24–26. "The storage server includes a mapping service that organizes one or more storage objects as a set of related objects"; "[t]he data storage system provides the physical space to the storage server"; and "[t]he client of the storage server includes a mapping client for the mapping service and a data cache . . . [and] [t]he mapping client provides the mapping between a logical addressable storage object to its physical location on the data storage system and caches the

physical address and contents of the storage objects in the data cache." *Id.* at 2:27–39; *see also id.* at 4:23–40, Fig. 1.

Here, Hayden's client of the storage server (item 3 in Figure 1) has a client-server relationship with the storage server (item 5 in Figure 1). For example, Hayden teaches that, "[i]f in step 203, mapping for logically addressable storage object is not present in the mapping client, the client communicates with the mapping server included in the storage server in 204 to retrieve the logical to physical address mapping." *Id.* at 10:8–12. Moreover, client of the storage server 3, which includes mapping client 2, is associated with what appears to be a computer labeled "USER." *Id.* at Fig. 1. The Examiner interprets client of the storage server 3 as part of the software operating on the "'USER' hardware." *See* Ans. 7. But, even if the "USER" label in Figure 1 can be interpreted as identifying a separate physical device from some other device that hosts client of the storage server 3, claim 22 does not preclude a user from accessing the "user's client device" via some other intermediary device.

Appellant's argument that Hayden's client of the storage server is "referred to **not** simply as a 'client' but rather as 'a client *of* the storage server'*, e.g., in column 2, line 26," because "[i]t is thus part of a *server*, **not** a <u>client device</u>" (Reply Br. 4), is unavailing. As the Examiner asserts, Hayden refers to a "'client "*of*" the storage server' not 'client "*in*" the storage server." Ans. 7. Figure 1 clearly shows that client of storage server 3 is distinct from storage server 5, and in fact includes the label "CLIENT OS." Hayden, Fig. 1. Thus, client of the storage server 3 is part of a user's client device.

We are also not persuaded by Appellant's arguments, with respect to Hayden's Figure 2, "that virtualization environment 10 is a type of server that is <u>separate from</u>, but is accessed by, user 11," and that "[u]ser devices, because of their limited speed and resources typically do **not** run hypervisors or VMWare, although servers often do." Appeal Br. 30; *see also* Reply Br. 4–5. Hayden's Figure 2 is analogous to Figure 1 in that it shows Mapping Client 21 on a host machine running Hypervisor 20 as distinct from Enterprise File Servers 24–26, each of which contain a mapping server 64. *See* Hayden, 4:60–63, 5:39–60, Figs. 2, 3. In operation, "Mapping Client 21 residing in Hypervisor uses NFS or File Mapping Protocol to communicate with the enterprise file server through IP network 23 for the location of the file or to allocate space for the file and then performs an I/O directly to the on-disk volume through IP network using SCSI protocol." *Id.* at 5:34–38. For similar reasons as discussed above with respect to Hayden's Figure 1, we agree with the Examiner that Hayden's Figure 2 shows a "user's client device." *See* Non-Final Act. 13. In addition, whether Hayden's Hypervisor 20 requires a certain amount of resources unavailable on a typical user device (*see* Appeal Br. 30) does not impact the conclusion that Hypervisor 20 includes Mapping Client 21, and is thus part of a user's client device.

For these reasons, we are not persuaded that the Examiner erred in finding that Hayden teaches the disputed limitations of claim 22. Accordingly, we sustain the Examiner's § 102 rejection of independent claim 22, as well as the Examiner's § 102 rejection of independent claims 1, 9, and 16 not argued separately with particularity. *See* Appeal Br. 30. We

also sustain the Examiner's § 102 rejection of dependent claims 6–8, 13–15, 20, 21, 26, and 27, not argued separately.

Claims 2–5, 10–12, 17–19, and 23–25

Turning to dependent claim 2, Appellant argues that the cited portions of Hayden fail to teach "receiving storage instructions from the user's client device over a remote direct memory access (RDMA) interface." Appeal Br. 31–32. Appellant's argument is persuasive of Examiner error.

The Examiner relies on Hayden's disclosure of "perform[ing] an I/O directly . . . using SCSI protocol" for teaching the RDMA limitation in claim 2. Non-Final Act. 13 (quoting Hayden, 5:37–38). As support for this finding, the Examiner cites RFC 5046 (*see id.*), which is a proposed standard document titled "Internet Small Computer System Interface (iSCSI) Extensions for Remote Direct Memory Access (RDMA)" (*See* Network Working Group, Request for Comments: 5046, *available at* https://tools.ietf.org/html/rfc5046). We agree with Appellant that "the Examiner can**not** read RFC 5046 into Hayden when there is **no** suggestion that RDMA is being employed, and certainly doing so is **improper** for an anticipation rejection." Appeal Br. 32.

Accordingly, we do not sustain the Examiner's § 102 rejection of dependent claim 2, as well as dependent claims 10, 17, and 23, which recite similar limitations.

With respect to dependent claim 3, Appellant argues that the cited portions of Hayden fail to teach "wherein the map further comprises a version number." Appeal Br. 32–33. Appellant's argument is persuasive of Examiner error.

The Examiner relies on Hayden's disclosure of a virtual machine embodiment that includes support for different versions of files for teaching the map version number limitation in claim 3. Non-Final Act. 13–14 (citing Hayden, 3:61–4:21, 9:2–23). Specifically, Hayden discloses that "thousands of virtual machines can be booted faster and requires less storage space due to integration of version files that only keeps unique blocks" (Hayden, 4:5–7) and that "[b]y integrating a mapping client into a Hypervisor and extending files version semantics to the logical view of the files and allowing virtual machines access to the special block sharing views of file resources, it dramatically decrease[s] the amount of I/O required" (*id.* at 9:5–9). This disclosure, however, relates to versions of *files* and the fact that storing only differences ("unique blocks" (*id.* at 47)) between versions of files saves time and space. The Examiner has not shown that Hayden teaches versions of *mappings* between virtual and physical addresses.

Accordingly, we do not sustain the Examiner's § 102 rejection of dependent claim 3, as well as claims 4 and 5 which depend therefrom, and dependent claims 11, 12, 18, 19, 24, and 25 which recite similar limitations.

DECISION

Because we sustain at least one ground of rejection with respect to each claim on appeal, we affirm the overall decision of the Examiner rejecting claims 1–27. *See* 37 C.F.R. § 41.50(a)(1).

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–27	101	Patent Ineligibility	1–27	
1–27	102	Hayden	1, 6–9, 13–16, 20–22, 26, 27	2–5, 10–12, 17–19, 23–25
Overall Outcome			1, 6–9, 13–16, 20–22, 26, 27	2–5, 10–12, 17–19, 23–25

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