UNITED STATES PATENT AND TRADEMARK OFFICE

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MARTIN & ASSOCIATES, LLC
P.O. BOX 548
CARTHAGE, MO 64836-0548

EXAMINER
BULLOCK JR, LEWIS ALEXANDER

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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 JOSEPH W. CROPPER[1]

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Appeal 2019-001921
Application 14/488,164[2]
Technology Center 2100

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Before JEFFREY S. SMITH, MICHAEL M. BARRY,
and DAVID J. CUTITTA II, *Administrative Patent Judges*.

BARRY, *Administrative Patent Judge*.

DECISION ON APPEAL[3]

Pursuant to 35 U.S.C. § 134(a), Appellant appeals from the Examiner's decision to reject claims 1–11, which are all the pending claims. *See* Appeal Br. 1–14; Non-Final 1–16. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Introduction

Appellant describes the invention as "relat[ing] to expediting host maintenance in a cloud computing environment by intelligently suspending essentially inactive virtual machines based on metrics of the virtual machines." Spec. ¶ 2.

Claim 1 is exemplary of the claims on appeal:

1. A method for placing a host with virtual machines in maintenance mode comprising:

providing an option to a user to expedite the maintenance mode;

in response to the user selecting to expedite the maintenance mode, reducing the number of virtual machines that must be migrated before entering the maintenance mode by:

determining at least one virtual machine on a host computer in a cloud computing system is an essentially inactive virtual machine;

suspending the at least one essentially inactive virtual machines to reduce the number of active machines that must be migrated before entering a maintenance mode; and

entering the maintenance mode.

Appeal Br. 12 (Claims App'x).

Rejections & References

The Examiner rejected claims 1–3 and 5–10 under 35 U.S.C. § 103 as unpatentable over Muller (US 2014/0165060 A1; June 12, 2014) and Wookey (US 2007/0171921 A1; July 26, 2007). Non-Final 3–9.

The Examiner rejected claims 4 and 11 under § 103 over Muller, Wookey, and Van Riel (US 2008/0208931 A1; Aug. 28, 2008). Non-Final 10–16.

ANALYSIS

We have reviewed the Examiner's rejections in light of Appellant's contentions of reversible error. We disagree with Appellant's conclusions. Instead, as consistent with our discussion below, we adopt the Examiner's findings and reasons as set forth in the Non-Final Office Action from which this appeal is taken and as set forth in the Answer. We highlight the following for emphasis.

Claim 1

In rejecting claim 1, the Examiner finds Muller teaches "providing an option to a user to identify inactive virtual machines" and, "in response to the user selecting to identify inactive virtual machines, reducing the number of virtual machines." Non-Final 4 (emphasis omitted) (citing Muller ¶¶ 37, 40). The Examiner then finds Wookey teaches a maintenance mode option, and relies on the combined disclosures of Muller and Wookey for teaching the two disputed limitations of (1) "providing an option to a user *to expedite the maintenance mode*" and (2) "in response to the user selecting *to expedite the maintenance mode*, reducing the number of virtual machines," as recited. *Id.* at 4–5 (citing Wookey ¶ 7) (emphasis modified). Appellant contends the Examiner errs in these findings. *See* Appeal Br. 4–8; Reply Br. 2–3.

For the first disputed limitation, Appellant argues Muller is deficient because it fails to teach presenting the user "an option to expedite [the] maintenance mode." Appeal Br. 5. This is unpersuasive because, as discussed in the prior paragraph, the Examiner relies on the combination of

Muller and Wookey for teaching the disputed limitation, i.e., the rejection
does *not* rely on Muller for teaching "to expedite the maintenance mode."
See In re Merck & Co. Inc., 800 F.2d 1091, 1097 (Fed. Cir. 1986)
(explaining that each reference cited by the Examiner must be read, not in
isolation, but for what it fairly teaches in combination with the prior art as a
whole); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (explaining one
cannot show nonobviousness by attacking references individually when the
rejection is based on a combination of references).

 Appellant also argues the Examiner errs in relying on the combination
of Muller and Wookey for teaching the second disputed limitation of "in
response to the user selecting to expedite the maintenance mode, reducing
the number of virtual machines," as recited. *See* Appeal Br. 5–7. In
particular, Appellant contends the Examiner, by finding that Muller teaches
"in response to the user selecting to identify inactive virtual machines,
reducing the number of virtual machines" (Non-Final 4 (emphasis omitted)),
"has fundamentally changed the nature of the invention by changing the
claim limitations" (i.e., because claim 1 recites "in response to the user
selecting *to expedite the maintenance mode*," not "in response to the user
selecting *to identify inactive virtual machines*"). Appeal Br. 5–6 (emphasis
added).

 This argument is unpersuasive for the same reason as the first
disputed limitation. The Examiner's finding that Muller teaches "in
response to the user selecting to identify inactive virtual machines" does not
change the claim limitations. It is a finding that the Examiner combines
with Wookey's "maintenance mode" to determine that the combination of

Muller and Wookey teaches the second disputed limitation. *See* Non-Final 4–6; *see also Merck*, 800 F.2d at 1097; *Keller*, 642 at 425.

Appellant further argues the Examiner makes piecemeal findings, the Examiner's combination of teachings from Muller and Wookey is conclusory, and "it is not at all 'understood' how the Examiner gets from these disjoint and piecemeal teachings to the actual claim limitations." Appeal Br. 6–7; *see also* Reply Br. 2–3 (arguing the rejection is a case of impermissible hindsight). These arguments are unpersuasive.

> Any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper.

In re McLaughlin, 443 F.2d 1392, 1395 (CCPA 1971). As the Examiner clarifies in response, and we agree:

> Muller teaches providing an option to a user to identify and suspend inactive virtual machines [Muller ¶0037-¶0040; see rejection in office action filed 2/28/18 for further details] and Wookey teaches performing maintenance (maintenance mode), wherein executing VMs are migrated from one host to another to facilitate the maintenance [Wookey ¶0007]. As Wookey is concerned with executing VMs, it would have been obvious to a person having ordinary skill in the art (PHOSITA) to incorporate the teachings of Muller onto Wookey to provide an option to the user to identify and suspend inactive virtual machines. Doing so would benefit Wookey because it would free up computing resources not being utilized (Muller ¶0037). **A PHOSITA would also recognize this combination would result in expediting maintenance since inactive virtual machines would have been suspended at the time of maintenance and therefore would no longer be migrated to another host since they are not executing.**

Ans. 6–7.

Appellant provides no persuasive evidence to show that combining the references' teachings as explained by the Examiner was "uniquely challenging or difficult for one of ordinary skill in the art." *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 419 (2007)). Absent such an assertion, we "take account of the inferences and creative steps that a person of ordinary skill in the art would employ," and find a person of ordinary skill in the art would overcome those difficulties within their level of skill. *KSR*, 550 U.S. at 418. We also note Appellant provides no evidence of secondary considerations, which our reviewing court guides "operates as a beneficial check on hindsight." *Cheese Sys., Inc. v. Tetra Pak Cheese & Powder Sys.*, 725 F.3d 1341, 1352 (Fed. Cir. 2013).

Appellant further argues Wookey is deficient because its disclosure for suspending inactive machines is "to free physical computing resources," not to facilitate a maintenance mode. Appeal Br. 7 (quoting Wookey ¶ 7); *see also id.* at 8 (contending "[a]t most, Wookey can be characterized by the Examiner to teach that a maintenance mode exists," but "Wookey cannot be properly interpreted to teach or suggest 'when placing the host in computer maintenance mode' as apparently alleged by the Examiner").

This argument is unpersuasive. Appellant interprets Wookey too narrowly. "A person of ordinary skill is also a person of ordinary creativity, not an automaton." *KSR*, 550 U.S. at 421. The benefit of suspending inactive virtual machines when performing hardware maintenance is a basic understanding of ordinarily skilled artisans, who would have understood Wookey's statement that "[e]xecuting virtual machines may be migrated . . .

to facilitate hardware maintenance," and "[i]nactive virtual machines may be suspended to free physical computing resources" teaches that the benefit of suspending VMs before migrating executing virtual machines to facilitate maintenance is "free[ing] physical computing resources . . . to allow the unused physical machines to be shutdown to save power" or "to be re-assigned for a different purpose." Wookey ¶ 7.

Accordingly, we sustain the § 103 rejection of claim 1 and, along with it, the § 103 rejection of claims 2, 3, 5–8, and 10, for which Appellant offers no substantive arguments separate from those for claim 1.

Claims 4 and 11

Appellant argues error in the rejection of claims 4 and 11 together as a group. Appeal Br. 9–10; *see also* Reply Br. 4–5. We select claim 4 as representative. 37 C.F.R. § 41.37(c)(1)(iv).

Claim 4 recites "[t]he method of claim 3[4] wherein the physical properties of the physical machine hosting the host computer include central processing unit (CPU) utilization, disk utilization and network utilization and the determination to suspend the VM is made when any one of these metrics is not above a threshold." Appeal Br. 12 (Claims App'x). The Examiner finds Muller, in view of Wookey, teaches all elements of claim 4 except for "disk utilization," which the Examiner finds Van Riel teaches. Non-Final 10–11 (citing Muller ¶¶ 20, 37; Van Riel ¶ 43).

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[4] Claim 3 recites "[t]he method of claim 2 wherein the metric of the host computer is a metric of the physical properties of the physical machine hosting the host computer. Appeal Br. 12 (Claims App'x). Claim 2 recites "[t]he method of claim 1 where in the step of determining the at least one virtual machine is an essentially inactive virtual machine further comprises the steps of: analyzing a VM based on a host metric; comparing the metric to a threshold; and determining to suspend the VM." *Id*.

Appellant argues the Examiner errs because, although Muller discusses cluster size, CPU, memory and networks as virtual computing resources, "these items in Muller refer to deployment settings for the deployment plan generator." Appeal Br. 9–10 (contending that "[i]n contrast to Muller, in claim 4 the physical properties are used to determine whether a virtual machine is essentially inactive").

This argument is unpersuasive. Muller teaches a "resource manager" with a "resource reclaimer" for identifying inactive VMs by analyzing logs that indicate "the amount of system resources consumed." Muller ¶ 37. The information in the logs "is analyzed (e.g., by comparing the information to a threshold) to determine if the virtual machine appears to be inactive and/or provisioned with excess resources." *Id.* Thus, the same consumed resource may be compared to a threshold both to determine if a VM is inactive and to determine if the VM was properly provisioned. Provisioned resources include physical resources such as CPU, memory, and network information. Muller ¶ 20. Therefore, contrary to Appellant's argument, Muller teaches that physical resources (or, "properties") are used to determine whether a virtual machine is essentially inactive.

Accordingly, we sustain the § 103 rejection of claims 4 and 11.

Claim 9

Appellant separately argues the Examiner errs in rejecting claim 9. Appeal Br. 8–9; *see also* Reply Br. 3–4. Claim 9 recites "[t]he method of claim 1 further comprising the step of providing an option to a user to expedite the maintenance mode when the maintenance mode is initiated by suspending essentially inactive virtual machines." Appeal Br. 13 (Claims

App'x). The Examiner finds the combined teachings of Muller and Wookey teach this limitation. Non-Final 8–9 (citing Muller ¶¶ 37, 40; Wookey ¶ 7).

Appellant initially contends Muller is deficient because it "does not address an option to the user to expedite the maintenance mode by suspending essentially inactive machines." Appeal Br. 8. This is unpersuasive because the rejection relies on Wookey, not Muller, for teaching "expedit[ing] the maintenance mode." *See Merck*, 800 F.2d at 1097; *see also Keller*, 642 at 425.

Appellant also contends Wookey is deficient because it "teaches about migration of **executing** virtual machines" and "does not teach or suggest anything about expediting the maintenance mode by suspending **inactive** virtual machines." Appeal Br. 8–9. This is unpersuasive, because the rejection relies on Muller, not Wookey, for suspending inactive VMs. *See* Non-Final 9 (citing Muller ¶ 40).

Appellant further contends the Examiner engages in hindsight and construes Muller too broadly, contending it "teaches giving the user an option to suspend virtual machines – nothing more." Reply Br. 3–4. Appellant construes Muller too narrowly. We discern no reversible error in the Examiner's determination that an ordinarily skilled artisan would have been motivated to combine Wookey's "maintenance mode" teaching with Muller as proposed by the Examiner, because she or he would have recognized that implementing Muller's teaching (in combination with Wookey, as explained in the rejection) "would provide the benefits of freeing up computing resources and minimizing the amount of virtual machines to be migrated when a maintenance mode is initiated"). Ans. 7–8.

Appellant has not provided persuasive evidence or argument to rebut the Examiner's findings or reasoning.

Accordingly, we sustain the § 103 rejection of claim 9.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–3, 5–10,	103	Muller, Wookey	1–3, 5–10,	
4, 11	103	Muller, Wookey, Van Riel	4, 11	
Overall Outcome			1–11	

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). *See* 37 C.F.R. § 41.50(f).

AFFIRMED