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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 WEIMIN PAN

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Appeal 2016-002713
Application 13/750,896
Technology Center 2100

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Before ALLEN R. MacDONALD, JAMES W. DEJMEK, and
ALEX S. YAP, *Administrative Patent Judges*.

MacDONALD, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134(a) from a final rejection of claim 1–20. We have jurisdiction under 35 U.S.C. § 6(b).

Representative Claims

Representative claims 1 and 7 under appeal read as follows (emphases added):

> 1. A redundant array of independent disks (RAID) storage system comprising: a storage controller with a storage management module to:
>
> identify storage volumes to be rebuilt and remaining storage volumes that are not to be rebuilt,
>
> calculate rebuild priority information for the identified storage volumes to be rebuilt based on storage information of the identified storage volumes, and
>
> generate an amount of *rebuild requests* to rebuild the identified storage volumes to be rebuilt and process *host requests* directed to the remaining and to be rebuilt storage volumes *based on the rebuild priority information* and amount of host requests,
>
> > wherein the amount of rebuild requests is associated with *a percentage of traffic* that is not less than a minimum rebuild traffic percentage or more than a maximum rebuild traffic percentage.
>
> 7. The storage system of claim 1, wherein the storage management module is further configured to assign storage volumes the minimum *rebuild traffic percentage* and the maximum rebuild traffic percentage *based on the rebuild priority information*.

Rejection

The Examiner rejected claims 1–20 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Williams (US 7,305,579 B2; iss. Dec. 4, 2007) and Nair et al (US 2013/0205166 Al; pub. Aug. 8, 2013).[1]

Issues on Appeal

Did the Examiner err in rejecting claim 1 as being obvious?

Did the Examiner err in rejecting claim 7 as being obvious?

ANALYSIS

We have reviewed the Examiner's rejections in light of Appellant's arguments (Appeal Brief and Reply Brief) that the Examiner has erred. We disagree with Appellant's conclusions.

Claim 1

A

Appellant contends that the Examiner erred in rejecting claim 1 under 35 U.S.C. § 103(a) because:

> First, by addressing element (iii)[2] . . . as two separate fragments, the rejection interpreted claim 1 in improper piecemeal fashion, thus changing the meaning of claim 1. Specifically, the rejection

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[1] Claims 1–6, 8–13, and 15–19 are argued as a subgroup; and claims 7, 12, and 20 are argued as a subgroup. We select claims 1 and 7 as representative of these subgroups. 37 C.F.R. § 41.37(c)(1)(iv)(2014). Separate patentability is not argued for claims 2–6 and 8–20. Except for our ultimate decision, claims 2–6 and 8–20 are not discussed further herein.

[2] "generate an amount of rebuild requests to rebuild the identified storage volumes to be rebuilt and process host requests directed to the remaining and to be rebuilt storage volumes based on the rebuild priority information and amount of host requests."

interpreted element (iii) as separate fragments mapped to two different references. Thus, the rejection interpreted element (iii) such that "generate an amount of rebuild requests to rebuild the identified storage volumes to be rebuilt" is not "based on the rebuild priority information and amount of host requests," as included in claim 1. As such, the rejection failed to address the relationships between these fragments of claim 1, and thus failed to consider the claim as a whole.

App. Br. 7 (emphasis omitted; footnote added).

Second, Williams say nothing whatsoever regarding the "amount of rebuild requests" being generated "based on the rebuild priority information and amount of host requests," as included in claim 1.

App. Br. 7 (emphasis omitted).

Third, Nair also fails to disclose or suggest this subject matter. Specifically, the cited portions of Nair say nothing regarding an "amount of rebuild requests" that is generated "based on the rebuild priority information and amount of host requests."

App. Br. 8 (emphasis omitted).

In the Answer, the Examiner responds:

Examiner respectfully disagrees and notes that the claims as presently presented do not establish a relationship between "generate an amount of rebuild requests" and "based on the rebuild priority information and amount of host requests". As such, the claims do not require that the generation be based on rebuild priority information.

Examiner further notes that, under the broadest reasonable interpretation, the "based on" may be interpreted as only related to the process host requests directed to the remaining and to be rebuild storage volumes.

If it were Appellant's intention to claim that the generation of an amount of rebuild request be based on a rebuild priority information and an amount of host requests then it should be expressly recited in the claims.

Ans. 4 (emphasis omitted).

In the Reply Brief, Appellant further argues:

> [I]t is noted that element (iii) is a continuous clause that is not divided by any punctuation (e.g., a comma or semi-colon) that would indicate that it should be interpreted as two separate clauses. It is well established that the rules of the written English language require some form of punctuation to provide a separation between different clauses or phrases. However, element (iii) does not include any punctuation that would indicate a separation between the two asserted limitations. Accordingly, the asserted interpretation is inconsistent with the established rules of written English, and is therefore improper.
>
> . . . .
>
> Further, it is submitted that the asserted interpretation is inconsistent with the specification. . . . [T]he specification clearly describes that rebuild requests are generated based on a rebuild priority information.

Reply Br. 3–4 (emphasis omitted).

As to Appellant's above contention, we disagree. The Examiner interprets so-called element (iii) "generate an amount of rebuild requests to rebuild the identified storage volumes to be rebuilt and process host requests directed to the remaining and to be rebuilt storage volumes based on the rebuild priority information and amount of host requests" as reading

(a) generate an amount of rebuild requests to rebuild the identified storage volumes to be rebuilt and

(b) process host requests directed to the remaining and to be rebuilt storage volumes based on the rebuild priority information and amount of host requests.

Appellant interprets element (iii) as reading

(a) generate an amount of rebuild requests to rebuild the identified storage volumes to be rebuilt [based on the rebuild priority information and amount of host requests] and

(b) process host requests directed to the remaining and to be rebuilt storage volumes based on the rebuild priority information and amount of host requests.

Appellant asserts the Examiner's reading of the claim is inconsistent with the rules of the written English language. To the contrary, in accordance with the precepts of English grammar, the position of the words in a sentence is the principal means of showing their relationships, and modifiers should be placed next to the words that they modify. William Strunk, Jr. & E.B. White, The Elements of Style 28, 30 (4th ed. 2000); *In re Hyatt*, 708 F.2d 712, 714 (Fed. Cir. 1983) ("A claim must be read in accordance with the precepts of English grammar."); *see, e.g., HTC Corp. v. IPCom GmbH & Co., KG*, 667 F.3d 1270, 1274-75 (Fed. Cir. 2012) (citing Strunk & White for the proposition that, in interpreting claim language, modifiers should be placed next to the words that they modify). Thus, a reader may assume that the claimed action "process host requests directed to the remaining and to be rebuilt storage volumes" is being modified by the language "based on the rebuild priority information and amount of host requests." We agree with the Examiner that "[i]f it were Appellant's intention to claim that the generation of an amount of rebuild request be based on a rebuild priority information and an amount of host requests then it should be expressly recited in the claims." Ans. 4.

We see no reason to reverse the Examiner's rejection based on this argument.

B

Also, Appellant contends that the Examiner erred in rejecting claim 1 under 35 U.S.C. § 103(a) because:

> It is submitted that **prioritizing the <u>order</u> of drives to be rebuilt**, as described in Williams, clearly fails to disclose or suggest generating an "*<u>amount</u> of rebuild <u>requests</u>*[.]"

App. Br. 7.

In the Answer, the Examiner responds:

> [T]he rejection of Claim[1] is based on the modification of Williams in light of the teachings of Nair. Appellant['s] arguments appear to be against the references individually. In response to Appellant['s] arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *See In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). . . . The claims merely require **generate an amount of rebuild requests to rebuild the identified storage volumes to be rebuilt**, which, as stated in the Final Rejection, is taught by Williams (Column 7, Lines 47-50). Williams teaches rebuilding an identified rebuild record, thus at least one rebuild request is generated, as claimed. It is noted that, under the broadest reasonable interpretation, the claimed **amount** may be one.

Ans. 4–5.

As to Appellant's above contention, we disagree. We agree with the Examiner that the broader claim 1 limitation "generate an amount of rebuild requests to rebuild the identified storage volumes to be rebuilt" is taught by Williams for the reasons set forth by the Examiner. We also agree with the Examiner that the Nair reference is relied upon for the narrower claim 1 limitation "wherein the amount of rebuild requests is associated with a percentage of traffic."

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C

Further, Appellant contends that the Examiner erred in rejecting claim 1 under 35 U.S.C. § 103(a) because:

[C]ontrary to the rejection, Nair says nothing whatsoever regarding the "rebuild rate" being a *"percentage of traffic,"* much less **both** a *"minimum* rebuild traffic percentage" **and a** *"maximum* rebuild traffic percentage," as included in claim 1. In fact, a review of Nair reveals that it is entirely silent regarding the term "traffic." Rather, as best understood, Nair describes the "rebuild rates" as "gradations of intensity in how a user wants to rebuild a RAID system [...],such as 'Low', 'High', 'Max' and 'No', respectively. . . .

Furthermore, Nair describes that the "time allotted for rebuild (rt)" is used, along with other variables, to calculate the "time delay DELTA," which is "used to delay rebuild IOs issued to the head of the individual drive queue." See Nair, par. [0055]-[0062]. Therefore, in view of this disclosure, it is evident that Nair does not disclose a "percentage of traffic." Rather, at best, it only discloses a percentage of time allotted to rebuild. A person of ordinary skill in the art will readily appreciate that, because the time period required for each IO could vary across different IO types and the particular IO task, the percentage of time allotted to rebuild does not disclose the percentage of traffic used for the rebuild.

. . .

[E]even further assuming for the sake of argument that the "time allotted for rebuild" of Nair could somehow disclose a percentage of traffic, the rejection is still lacking. Specifically, Nair says nothing whatsoever about a "time allotted for rebuild" that is not less than a minimum "time allotted for rebuild" or more than a maximum "time allotted for rebuild."

App. Br. 8–9 (emphasis omitted).

In the Answer, the Examiner responds:

Nair [0056] discloses that the Low, High, Max categories have a set range of rebuild percentage rate, which goes from a minimum to a maximum. For example, "Low" has a rebuild rate that goes

from 33% to 65%. Examiner notes that Nair [0056] distinguishes between a "Time Allotted For Rebuild (rt)" and "Rebuild Rate".

As previously discussed, Nair [0019] states that the rebuild rate indicates how fast the rebuilds will occur vis-a-vis the host IOs. How fast rebuilds occur is an indication of an amount of rebuilds. Thus, the amount of rebuild requests that will be generated in the Low setting is associated with a percentage of traffic that is not less than the minimum rebuild traffic percentage 33% or more than a maximum rebuild traffic percentage 65%. Therefore, a number of rebuild requests will be generated, which will correspond to a rebuild traffic percentage.

Ans. 9.

As to Appellant's above contention, we disagree. Rather, Nair's paragraph 56 is explicit that the rebuild rate can have a range from a minimum to a maximum. Further, an artisan would recognize these rates and their "time allotted for rebuild . . . ascertained compared to the total time for rebuild including both host IO and rebuild IO requests" (Nair ¶ 56) correspond to a percentage of traffic.

Further, Appellant's argument that the specific terminology *"percentage of traffic"* is not used in Nair is equally unpersuasive. There is no *ipsissimis verbis* test within 35 U.S.C. § 103. Appellant's assertion that claim limitations are not expressly recited in a reference does not evidence lack of prima facie obviousness, but, rather, "begs the substantive question of whether there are facial differences to be bridged." *See In re Jung*, 637 F.3d 1356, 1363 (Fed. Cir. 2011). A reference does not have to satisfy an *ipsissimis verbis* test to disclose a claimed element, therefore Appellant's demand for such an exacting match is not persuasive of error. *See In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009).

We agree with the Examiner that these argued claim 1 limitations are taught for the reasons set forth by the Examiner.

D

Further, Appellant contends that the Examiner erred in rejecting claim 1 under 35 U.S.C. § 103(a) because:

> [T]he provided rationale for the proposed combination of Williams and Nair is insufficient. Specifically, the rejection asserted that this particular modification of Williams would have been obvious "in order to prevent host IO starvation during a rebuild process." See Office Action, p. 5 (emphasis added). However, Appellant notes that this rationale assumes the existence of a specific problem in Williams, namely that, if host IOs are too low in priority in relation to rebuild IOs, the host IOs are not executed or "starved." However, Williams does not describe or even contemplate this particular problem. In fact, Williams appears to be entirely silent regarding host IOs, much less starvation of host IOs.

App. Br. 10 (emphasis omitted).

In the Answer, the Examiner responds:

> [O]bviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071 . . . (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347 . . . (Fed. Cir. 1992), and *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398 . . . (2007).

Ans. 11.

As to Appellant's above contention, we disagree. In addition to agreeing with the Examiner's response, we note Appellant's argument does not address the actual reasoning of the Examiner's rejection. Instead Appellant attacks the Williams reference singly for lacking teachings that

the Examiner relied on the Nair reference in a combination of the references to show. It is well established that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *See In re Keller*, 642 F.2d 413 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091 (Fed. Cir. 1986). This form of argument is inherently unpersuasive to show Examiner error. Our reviewing court requires that references must be read, not in isolation, but for what they fairly teach in combination with the prior art as a whole. *Merck*, 800 F.2d at 1097 (Fed. Cir. 1986).

Claim 7

Appellant contends that the Examiner erred in rejecting claim 7 under 35 U.S.C. § 103(a) because:

> [A] review of the cited portions of Nair reveals that they say nothing whatsoever about a module to "assign storage volumes the minimum rebuild traffic percentage and the maximum rebuild traffic percentage based on the rebuild priority information." Rather, at best, ***Nair describes*** something substantially different, namely ***a single "rebuild rate"*** that is selected by a user to rebuild an entire "RAID system."

App. Br. 11–12 (emphasis omitted; emphasis added).

As to Appellant's above contention, we disagree that the Examiner has erred. Claim 7 reads (with emphasis):

> The storage system of claim 1, wherein the storage management module is further configured to assign ***storage volumes*** the minimum rebuild traffic ***percentage*** and the maximum rebuild traffic percentage ***based on the rebuild priority information***.

The premise of Appellant's contention is claim 7 cannot be interpreted as being *a single rebuild rate that is selected by a user to rebuild an entire RAID system*, but rather claim 7 requires plural rebuild rates each for one of

plural parts of the RAID system. We find no basis for Appellant's argument.

Claim 1 recites "storage volumes" and the Examiner's rejection treats these as a singular unit of volumes for which a single range of rebuild traffic percentages is assigned. We do not find where Appellant disputes this interpretation of claim 1. Therefore we read the "storage volumes" of claim 7 similarly as a singular unit of volumes. Our interpretation of this as a singular unit is reinforced by the remainder of claim 7 which recites "a minimum rebuild traffic percentage and the maximum rebuild traffic percentage," that is, only a single "percentage" range.

The only part of claim 7 not previously recited in claim 1 is the new limitation that the claim 1 "minimum rebuild traffic percentage and the maximum rebuild traffic percentage" range is assigned "based on the rebuild priority information." In addition to the reasons *supra* in Section *Claim 1*, A., this new limitation contradicts Appellant's claim 1 argument that "based on the rebuild priority information" in claim 1 already modifies the "amount of rebuild requests." To so construe claim 1 would render claim 7 redundant to claim 1. Under the doctrine of claim differentiation, "the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (en banc).

CONCLUSIONS

(1) The Examiner has not erred in rejecting claims 1–20 as being unpatentable under 35 U.S.C. § 103(a).

(2) Claims 1–20 are not patentable.

DECISION

The Examiner's rejections of claims 1–20 are affirmed.

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).

<u>AFFIRMED</u>