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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* WILLIAM H. MOORE, JEFFREY S. BONWICK, and  
MATTHEW A. AHRENS

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Appeal 2010-009166  
Application 11/407,719  
Technology Center 2100

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Before ALLEN R. MacDONALD, JUSTIN BUSCH, and HUNG H. BUI,  
*Administrative Patent Judges.*

BUI, *Administrative Patent Judge.*

DECISION ON APPEAL

Appellants<sup>1</sup> seek our review under 35 U.S.C. § 134(a) of the Examiner's final rejections of claims 1, 3-5, 7, 8, 10-12, 14, 15, 17-19, and 21.<sup>2</sup> We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.<sup>3</sup>

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<sup>1</sup> Real Party in Interest is Sun Microsystems, Inc.

<sup>2</sup> Claims 2, 6, 9, 13, 16, and 20 have been cancelled and are not on appeal.

<sup>3</sup> Our decision refers to Appellants' Appeal Brief filed December 22, 2009 ("App. Br."); Examiner's Answer mailed March 16, 2010 ("Ans."); Final Office Action mailed June 11, 2009 ("FOA"); and the original Specification filed April 19, 2006 ("Spec").

STATEMENT OF THE CASE

*Appellants' Invention*

According to Appellants, their invention relates to methods and systems for resilvering metadata and data in a storage pool including one or more physical disks, in which blocks containing metadata in the storage pool are resilvered prior to resilvering blocks containing data in the storage pool. Spec. ¶0037, and Abstract.

*Claims on Appeal*

Claims 1, 8, and 15 are independent. Claim 1 is representative of the invention, as reproduced below with disputed limitations emphasized:

1. A method for resilvering a storage pool, comprising:

determining whether any of a first plurality of blocks in the storage pool, comprising metadata, require resilvering;

determining whether any of a second plurality of blocks in the storage pool, comprising data, require resilvering;

resilvering all of the first plurality of blocks that require resilvering; and

resilvering all of the second plurality of blocks that require resilvering, ***wherein all of the first plurality of blocks [comprising metadata] that require resilvering are resilvered prior to resilvering any of the second plurality of blocks [comprising data],***

wherein the first plurality of blocks comprises:

a root block;

a third plurality of blocks comprising global file system metadata, wherein the root block references a block in the third plurality of blocks and wherein the global file system metadata comprises metadata for a plurality of file systems; and

a fourth plurality of blocks comprising file system metadata, wherein a block in the third plurality of blocks references a block in the fourth plurality of blocks, and wherein the file system metadata is associated with one of the plurality of file systems.

#### *Evidence Considered*

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Timpanaro-Perrotta	U.S. 2003/0177324 A1	Sep. 18, 2003
Crockett	U.S. 2003/0177322 A1	Sep. 18, 2003
Hitz	U.S. 2006/0184821 A1	Aug. 17, 2006

#### *Examiner's Rejections*

(1) Claims 1, 3-4, 8, 10-11, 15, 17, and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hitz and Timpanaro-Perrotta ("Timpanaro").<sup>4</sup> Ans. 3-6.

(2) Claims 5, 7, 12, 14, 19, and 21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hitz, Timpanaro, and Crockett.<sup>5</sup> Ans. 6-7.

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<sup>4</sup> For purposes of this appeal, claims 1, 3-4, 8, 10-11, 15, 17, and 18 stand or fall together. According to Appellants, claim 1 is representative of claims 1, 3-4, 8, 10-11, 15, 17, and 18. App. Br. 7.

<sup>5</sup> Likewise, claims 5, 7, 12, 14, 19, and 21 stand or fall together. According to Appellants, claim 5 is representative of claims 5, 7, 12, 14, 19, and 21. App. Br. 7.

## ISSUES

Based on Appellants' arguments, the dispositive issues on appeal are:

(1) Whether the combination of Hitz and Timpanaro discloses or suggests all limitations of Appellants' independent claim 1, including "resilvering a plurality of blocks" and "resilvering blocks of metadata before resilvering blocks of data" (App. Br. 7-12); and

(2) Whether the combination of Hitz, Timpanaro, and Crockett discloses or suggests the limitation of "resilvering all of the first plurality of blocks that require resilvering comprises using a dirty time log (DTL), wherein the DTL comprises a birth time corresponding to a transaction group associated with an input/output (I/O) request to store a block in the first plurality of blocks," as recited in claim 5 (App. Br. 13).

## ANALYSIS

We have reviewed the Examiner's rejections in light of Appellants' arguments that the Examiner has erred. Only those arguments actually made by Appellants in the Appeal Brief have been considered. *See* 37 C.F.R. § 41.37(c)(1)(vii).

We disagree with Appellants' contentions as to all rejections. We adopt as our own (1) the findings and reasons set forth by the Examiner in the action from which this appeal is taken and (2) the reasons set forth in the Examiner's Answer in response to Appellants' Appeal Brief. We also concur with the conclusions reached by the Examiner. We further highlight and address specific findings and arguments for emphasis as follows.

***Claims 1, 3-4, 8, 10-11, 15, 17, and 18***

Appellants contend that the combination of Hitz and Timpanaro does not disclose or suggest all limitations of Appellants' independent claim 1, including "resilvering a plurality of blocks" and "resilvering blocks of metadata before resilvering blocks of data." App. Br. 7-12. In particular, Appellants make several arguments against the application of Hitz and Timpanaro, including:

(1) Hitz does not disclose or suggest "resilvering a plurality of blocks";

(2) the Examiner has at least improperly construed the term "***resilvering***" and subsequently, using the improper construction of the claim term, incorrectly characterized Hitz as teaching "***resilvering***" ... refers to synchronizing a mirrored disk that has become unsynchronized;

(3) the Examiner has erroneously equated determining that a disk has failed to determining whether a plurality of blocks within a storage pool require ***resilvering*** . . .

(4) Timpanaro does not disclose or suggest "resilvering blocks of metadata before resilvering blocks of data."

App. Br. 9-12 (emphasis added).

However, we find none of Appellants' arguments persuasive to demonstrate reversible error in the Examiner's position. *See In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011). First, and as correctly found by the Examiner, the term "resilvering" does not require "mirroring" or refer only to "synchronizing a mirrored disk that has become unsynchronized" as

asserted by Appellants. Ans. 8-10. In fact, as expressly acknowledged by Appellants in their own prior provisional application, Serial No. 60/734,023, “resilvering may also be performed on systems implementing RAID-5 and other similar replication schemes,” as in the Examiner’s combination of Hitz and Timpanaro. Ans. 10 citing ¶[35] of application Serial No. 60/734,023. In view of Appellants’ own disclosure and Appellants’ inconsistent view of the term “resilvering,” we find the Examiner’s construction of the term “resilvering” is correct and fully supported by those skilled in the art. As such, we agree with the Examiner’s findings that Hitz discloses resilvering a plurality of blocks. Ans. 4; *also see* Hitz, ¶[0004], ¶[0007], ¶[0010], and FIG. 8.

Second, and as correctly noted by the Examiner, Hitz discloses a storage pool’s file system structure including metadata and data of a plurality of blocks and resilvering the contents of the drives which contain blocks of metadata and data. Ans. 4, 12. Timpanaro, as a secondary reference, is simply cited for disclosing prioritizing metadata ahead of data when backing up. *Id.* Specifically, Timpanaro describes in ¶[0023]-¶[0024] that:

the backup program 24 would include the capability to allow an administrator to assign a backup priority to all files, directories or file groups in the file system 8 maintained in the file system backup 22. File groups may be associated with users or applications. FIG. 2 illustrates how file metadata 50, which may comprise the metadata maintained with files as part of the file system, includes a backup priority field 52 indicating a backup priority of the file.

FIG. 3 illustrates a backup priority table 70 maintained by the backup program 20 that associates different types of files or specific files with different backup priority values. For

instance, the system configuration files and the file allocation table, which must be restored before anything else can run, have the highest backup priority and are restored first. A database application program and database tables, which may be needed by many of the clients *4a, b, c*, have the next highest priority values, and are the next group of files restored. In the described implementations, the clients *4a, b, c* have access to files associated with a backup priority value that have been restored and before files associated with lower backup priority values are restored. This reduces the time files are unavailable as a result of a restore operation.

(Emphasis added).

In view of the teachings of Hitz regarding the resilvering of a plurality of blocks and Timpanaro regarding the backup priority for metadata, we agree with the Examiner's findings that the combination of Hitz and Timpanaro discloses or suggests resilvering blocks of metadata before resilvering blocks of data, as recited in Appellants' claim 1.

We further note that:

[T]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference . . . . Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.

*In re Keller*, 642 F.2d 413, 425 (CCPA 1981); *see also In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983) (“[I]t is not necessary that the inventions of the references be physically combinable to render obvious the invention under review”). Contrary to Appellants' arguments, the Hitz-Timpanaro combination discloses the disputed limitation of Appellants' claim 1.

For the reasons set forth above, Appellants have not persuaded us of error in the Examiner's rejection of independent claim 1 as well as claims 3-

4, 8, 10-11, 15, 17, and 18 under 35 U.S.C. §103(a) as being unpatentable over Hitz and Timpanaro.

***Claims 5, 7, 12, 14, 19, and 21***

Appellants also contend that the combination of Hitz, Timpanaro, and Crockett does not disclose or suggest the limitation of “resilvering all of the first plurality of blocks that require resilvering comprises using a dirty time log (DTL), wherein the DTL comprises a birth time corresponding to a transaction group associated with an input/output (I/O) request to store a block in the first plurality of blocks,” as recited in claim 5. App. Br. 13. In particular, Appellants argue:

“Crockett includes no description or discussion regarding the content of the timestamps. It is, therefore, impossible that the use of the term timestamp in Crockett discloses using a DTL, wherein the DTL comprises a birth time corresponding to a transaction group associated with an input/output (I/O) request to store a block in the first plurality of blocks,”

as recited in Appellants’ claim 5. App. Br. 13 (emphasis added).

Again, we are not persuaded by Appellants. As correctly found by the Examiner, Crockett discloses keeping a record of timestamps of tracks or record sets (DTL including birthtime) that have been changed (I/O) to aid in resynchronization (in resilvering) and ensuring consistency. Ans. 14 citing Crockett, ¶[0018], ¶[0029], ¶[0035], and ¶[0058]. In addition, Crockett also discloses that “a record set itself also contains a timestamp that is evidence of its time of creation,” and “generating timestamps such that any two write calls will always have unique timestamps associated therewith.” See ¶[0046] and ¶[0037] of Crockett. Therefore, and contrary to Appellants’ arguments,

Appeal 2010-009166  
Application 11/407,719

the combination of Hitz, Timpanaro, and Crockett discloses the disputed limitation of Appellants' claim 5.

For the reasons set forth above, Appellants have not persuaded us of error in the Examiner's rejection of claim 5 as well as claims 7, 12, 14, 19, and 21 under 35 U.S.C §103(a) over Hitz, Timpanaro, and Crockett.

#### CONCLUSION

On the record before us, we conclude that the Examiner has not erred in rejecting claims 1, 3-5, 7, 8, 10-12, 14, 15, 17-19, and 21 under 35 U.S.C. § 103(a).

#### DECISION

As such, we affirm the Examiner's final rejections of claims 1, 3-5, 7, 8, 10-12, 14, 15, 17-19, and 21.

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) (2011).

AFFIRMED

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