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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/496,773	09/25/2014	Robert C. Swanson	P69398	1023
88032	7590	01/31/2019	EXAMINER	
Jordan IP Law, LLC 12501 Prosperity Drive, Suite 401 Silver Spring, MD 20904			BONE, DUSTIN	
			ART UNIT	PAPER NUMBER
			2137	
			NOTIFICATION DATE	DELIVERY MODE
			01/31/2019	ELECTRONIC

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* ROBERT C. SWANSON, ROBERT W. CONE,  
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JAY H. DANVER, CHRIS KUN K. CHEUNG,  
SATISH R. NATLA, and RODEL I. CRUZ-HERRERA

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Appeal 2018-005885  
Application 14/496,773  
Technology Center 2100

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Before JAMES R. HUGHES, LINZY T. McCARTNEY, and  
SCOTT E. BAIN, *Administrative Patent Judges*.

McCARTNEY, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants seek review under 35 U.S.C. § 134 of the Examiner's final rejection of claims 1–24. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

## BACKGROUND

The present patent application “relate[s] to establishing cold storage pools from aging memory.” Specification ¶ 1, filed September 25, 2014 (“Spec.”). Claims 1, 7, 13, and 19 are independent. Claim 1 illustrates the claimed subject matter:

1. A cold storage-based computing system, comprising:
  - a memory device including a target memory region and a contiguous cold storage pool;
  - a plurality of processors;
  - a shared memory controller coupled to the plurality of processors and the memory device, the shared memory controller including:
    - a write monitor to detect a pending write operation directed to the target memory region,
    - a degradation detector coupled to the write monitor, the degradation detector to determine whether the target memory region satisfies a degradation condition in response to the pending write operation; and
    - a cold storage migrator coupled to the degradation detector, the target memory region, and the contiguous cold storage pool, the cold storage migrator to reconfigure the target memory region as a cold storage region if the target memory region satisfies the degradation condition such that the capacity of the contiguous cold storage pool increases, wherein the contiguous cold storage pool is mapped to the cold storage region.

Appeal Brief 17, filed June 13, 2017 (“App. Br.”).

## REJECTIONS

Claims	Basis	References
1, 2, 5–8, 11–14, 17–20, 23, and 24	§ 102	Zhong <sup>1</sup>
3, 9, 15, and 21	§ 103	Zhong and Joshi <sup>2</sup>
4, 10, 16, and 22	§ 103	Zhong and Ha <sup>3</sup>

## DISCUSSION

We have reviewed the Examiner’s rejections and Appellants’ arguments, and we disagree with Appellants that the Examiner erred. As consistent with the discussion below, we adopt the Examiner’s findings, conclusions, and reasoning in the Final Office Action mailed November 16, 2016 (“Final Act.”) and the Answer mailed October 19, 2017 (“Ans.”). We address Appellants’ arguments in turn.

### Claim 1

Appellants contend Zhong does not disclose the “memory device,” “shared memory controller,” and “cold storage migrator” recited in claim 1. *See App. Br. 11–12.* Appellants assert Zhong does not disclose both “the memory device includes a contiguous cold storage pool” and “a plurality of processors.” *App. Br. 13* (emphasis omitted). Appellants also argue Zhong does not disclose “reconfiguring the target memory region as a cold storage region.” *App. Br. 13* (emphasis omitted).

We find Appellants’ arguments unpersuasive. Appellants repeat or summarize certain parts of Zhong and assert, without explanation, that Zhong does not disclose the elements noted above. *See App. Br. 12–14.*

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<sup>1</sup> Zhong et al. (US 2013/0232289 A1; Sept. 5, 2013).

<sup>2</sup> Joshi et al. (US 2014/0068183 A1; Mar. 6, 2014).

<sup>3</sup> Ha et al. (US 2009/0201721 A1; Aug. 13, 2009).

These assertions not only lack support but also fail to address each part of Zhong cited by the Examiner. *Compare* App. Br. 11–14 (summarizing Zhong ¶¶ 2–15, 38–57 and quoting Zhong Abstract), *with* Final Act. 3–4 (citing Zhong ¶¶ 29, 48, 53, 58, 59, 78, 80, 100, 113, 115, Fig. 2A). These unsupported assertions do not show the Examiner erred. *Cf. In re Lovin*, 652 F.3d 1349, 1357 (Fed. Cir. 2011) (holding “that the Board reasonably interpreted Rule 41.37 to require more substantive arguments in an appeal brief than a mere recitation of the claim elements and a naked assertion that the corresponding elements were not found in the prior art”).

In any event, we agree with the Examiner that Zhong discloses the disputed limitations. The Examiner found Zhong discloses a memory device with a low-priority or low-use pool that corresponds to the recited “contiguous cold storage pool.” *See* Final Act. 3–4 (citing Zhong ¶¶ 48, 53, 58, 78, 80, 100, 113, 115, Fig. 2A); Ans. 3 (citing Zhong ¶¶ 48, 57, 78, 80, Fig. 2B). We see no meaningful difference between this low-use pool and the recited contiguous cold storage pool. Both the low-use pool and the contiguous cold storage pool consist of a block of logical address space used to hold infrequently accessed data. *Compare* Zhong ¶¶ 48 (explaining that initializing storage sections of physical address space 590 involves placing “a reference and/or link to the” sections in a pool), 80–81 (disclosing that low-priority pool 149 includes storage sections “identified as being fragile and/or low-use” and equating “low-use” and “cold” data), Fig. 2B (showing the structure of low-use pool 149 and the relationship between low-use pool 149 and physical address space 590), *with* Spec. ¶¶ 9–10 (disclosing that “the cold storage pool may be used to store large amounts of infrequently changing data” and that a cold storage pool may consist of “logical and/or

virtual address space”), Fig. 2 (showing the relationship between cold storage pool 22 and “actual storage capacity 26”).

As for the recited “plurality of processors,” the Examiner found Zhong discloses that processor 117 can be several processors. *See* Ans. 3 (citing Zhong ¶ 33). Zhong provides adequate support for this finding. *See* Zhong ¶ 33 (“The processor 117 may comprise one or more general and/or special purpose processing elements.” (emphasis omitted)). Finally, for “reconfigur[ing] the target memory region as a cold storage region,” the Examiner found that Zhong discloses this limitation because Zhong describes identifying storage sections with health metrics that differ from a threshold metric and placing the identified storage sections in a low-use pool. *See* Final Act. 4 (citing Zhong ¶¶ 48, 53, 78, 80, 100, 113, 115); Ans. 4 (citing Zhong ¶¶ 48, 52–53, 80). Zhong adequately supports this finding. *See, e.g.*, Zhong ¶¶ 109–113, Fig. 7. Because we agree with the Examiner that a low-use pool is “a contiguous cold storage pool” for the reasons discussed above, we also agree that placing identified storage sections into a low-use pool discloses “reconfigur[ing] the target memory region as a cold storage region.”

For at least the above reasons, we sustain the Examiner’s rejection of claim 1.

### Claim 3

Claim 3 depends from claim 1 and recites “wherein the shared memory controller further includes a cold storage reporter coupled to the cold storage migrator, the cold storage reporter to expose the cold storage region to an operating system as part of the contiguous cold storage pool.” App. Br. 17. Appellants argue Zhong does not disclose this limitation

because “Zhong discloses a series (i.e., an ordered/and or prioritized queue) of *fragmented* solid state storage sections.” App. Br. 14 (bold omitted).

We find Appellants’ argument unpersuasive. We understand Appellants to argue that Zhong does not disclose “the contiguous cold storage pool.” The written description suggests that a “contiguous cold storage pool” includes a block of logical address space that maps to non-contiguous physical memory. *See, e.g.*, Spec. ¶¶ 9 (explaining that “a user exposed storage capacity 20 (e.g., logical and/or virtual address space) includes a contiguous cold storage pool 22 and is mapped . . . to an actual storage capacity 26 (e.g., memory device, physical address space)”), 10 (“[C]old storage pool 22 maps to various *non-contiguous* cold storage regions 28.” (emphasis added)); *see also* Spec. Fig. 2. Zhong’s low-use pool is also a block of logical address space that maps to non-contiguous physical memory. *See* Zhong ¶¶ 48, 78, 80–81, 110–113, Fig. 2B. For at least this reason, we sustain the Examiner’s rejection of claim 3.

#### Remaining Claims

Appellants do not present separate, persuasive arguments for claims 2 and 4–24. We thus sustain the Examiner’s rejections of these claims.

DECISION

<b>Claims Rejected</b>	<b>Basis</b>	<b>References</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 2, 5–8, 11–14, 17–20, 23, and 24	§ 102	Zhong	1, 2, 5–8, 11–14, 17–20, 23, and 24	
3, 9, 15, and 21	§ 103	Zhong and Joshi	3, 9, 15, and 21	
4, 10, 16, and 22	§ 103	Zhong and Ha	4, 10, 16, and 22	
<b>Summary</b>			1–24	

No 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