UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WARD D. PARKINSON

Appeal 2008-3464
Application 10/939,142
Technology Center 2800

Decided: September 25, 2008

Before MAHSHID D. SAADAT, ROBERT E. NAPPI, and KEVIN F. TURNER, *Administrative Patent Judges*.

TURNER, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134 from the Final Rejection of claims 1-38. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

Appellant's claimed invention relates to phase change memories which use phase change materials that may be switched between different detectable states. (Spec. 1:2-13).

Independent claim 1 is illustrative of the invention and reads as follows:

> 1. A method comprising:
>
> forming a one time programmable chalcogenide phase change memory.

Also, as discussed below, Appellant has raised arguments against only certain claims, where claims 3, 4, and 11 are representative thereof:

> 3. The method of claim 2 including forming an open circuit at said cell.
>
> 4. The method of claim 2 including forming a cell containing phase change material and a conductor and causing said phase change material and said conductor to mix.
>
> 11. The method of claim 10 including packaging said memory so that said write pin is inaccessible to the user.

The Examiner relies on the following prior art references to show unpatentability:

Purdham	US 5,450,426	Sep. 12, 1995
Madurawe	US 5,898,630	Apr. 27, 1999
Lung	US 6,579,760 B1	Jun. 17, 2003
Fricke	US 6,643,159 B2	Nov. 4, 2003

Claims 1-38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fricke, Madurawe, Lung, and Purdham.

We note that Appellant states explicitly that claims 1-38 are the subject of the instant appeal, (App. Br. 5), discusses the subject matter of all pending claims, (App. Br. 7-10), and requests that "each of the final

rejections be reversed." (App. Br. 14). However, as the Examiner notes, (Ans. 7), Appellant has not offered any convincing arguments regarding claims 1, 2, 5-10, 12, 13, 16-19, 21, 22, 25-28, 30, 31, and 34-37.

Appellant's arguments discuss claims 3, 4, and 11 as a group, claims 4, 14, 24 and 33 as a group, and claims 11, 20, 29, and 38 as a group. As Appellant's arguments have not specifically addressed 1, 2, 5-10, 12, 13, 16-19, 21, 22, 25-28, 30, 31, and 34-37 we construe Appellant's arguments as having grouped these claims with claim 3. Accordingly we will discuss the rejection of claims 1-38 under 35 U.S.C. § 103(a) as directed to three groups. The first group of claims consisting of claims 1-13, 16-19, 21, 22, 25-28, 30, 31, and 34-37 with claim 3 as representative, the second group consisting of claims 4, 14, 24 and 33 with claim 4 as representative of the group, and the third group consisting of claims 11, 20, 29, and 38 with claim 11 as representative of the group. Arguments which Appellant could have made but chose not to make in the Briefs have not been considered and are deemed to be waived [see 37 C.F.R. § 41.37(c)(1)(vii)].

ISSUES

1. Under 35 U.S.C. § 103(a), with respect to appealed claim 3, do Fricke, Madurawe, Lung, and Purdham teach or suggest forming an open circuit as recited in claim 3?

2. Under 35 U.S.C. § 103(a), with respect to appealed claim 4, do Fricke, Madurawe, Lung, and Purdham teach or suggest causing a phase change material and the conductor to mix as recited in claim 4?

3. Under 35 U.S.C. § 103(a), with respect to appealed claim 11, do Fricke, Madurawe, Lung, and Purdham teach or suggest packaging the

memory so that he write pin is inaccessible to the user as recited in claim 11?

FINDINGS OF FACT

1. The Specification details that a one time programmable (OTP) memory includes a variable resistance memory array. The variable resistance memory array consists of a plurality of cells including phase change memory elements. The memory also includes a read sense amplifier and an OTP write interface, where the write interface may be coupled to a pin to enable the interface and can be made inaccessible after shipping of the memory. (Spec. 3:8 – 4:14; Figs. 1 and 2, elements 10, 12, 20, 22, 23, 50, and 56).

2. Fricke is directed to a cubic memory array made up of memory cells having storage elements and controls elements using wordlines and bitlines. The storage elements may include OTP memory, but no particulars of that OTP memory are provided in Fricke. (Col. 2, ll. 59-61; col. 6, ll. 18-37; Fig. 1, elements 18, 20, 22, 24, 26, and 30).

3. Fricke also describes that storage elements in the memory may be left unprogrammed and thus open circuited for an antifuse. (Col. 10, l. 65 – col. 11, l. 4).

4. Fricke refers to local heating that occurs in the storage material during the process of programming which sufficiently heat the fusing site. (Col. 8, ll. 9-18).

5. Madurawe describes a dynamic nonvolatile memory cell which is reprogrammable. The programmable memory elements that make up the

memory cell can be fabricated using OTP devices such as fuses or antifuses. (Abstract; Col. 9, ll. 2-3).

6. Lung describes a self-aligned, programmable phase change memory where the phase change material may be chalcogenides. (Abstract; col. 2, ll. 12-15).

7. Purdham is directed to continuous error detection in a memory device using duplicate core memory cells. The memory device includes a write interface coupled to a decoder, where the address signal is generated using known circuitry by decoding the user access request. (Abstract; col. 3, ll. 33-59).

PRINCIPLES OF LAW

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). "[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability." *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). Furthermore,

> ". . . .there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness' . . . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ."

KSR Int'l Co. v. Teleflex Inc., 127 S. Ct. 1727, 1741 (2007)(quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

During examination, the claims must be interpreted as broadly as their terms reasonably allow. *In re Am. Acad. of Sci. Tech Center*, 367 F.3d 1359, 1369 (Fed. Cir. 2004). When the specification states the meaning that a term in the claim is intended to have, the claim is examined using that meaning, in order to achieve a complete exploration of the applicant's invention and its relation to the prior art. *In re Zletz*, 893 F.2d 319, 321-22 (Fed. Cir. 1989).

ANALYSIS

Appellant argues, with respect to claim 3, that the claim recites forming an open circuit in the cell and that "Fricke does not teach how to make an open circuit," and that Lung "does not suggest how to do it and, specifically, does not suggest forming an open circuit." (App. Br. 13). The Examiner finds that the combination of Fricke, Madurawe, and Lung would render obvious a process of how to create an open circuit by no programming of a storage element. (Ans. 8). We agree.

Given that Fricke provides that the storage element may be left unprogrammed, (FF. 3), and thus open circuited for an antifuse, we do not see how the process of "forming an open circuit" is not rendered obvious. Appellant makes several arguments that embodiments in Fricke which use the phase change material are not antifuse and Fricke only details that they encompass a resistance change. (Reply Br. 1-3). But the rejection proffers the combination of Fricke, Madurawe, and Lung, and Appellant has provided no argument as to why embodiments in Fricke could not be altered based on Madurawe and Lung, as indicated in the rejection of claim 3. As

such, we are not persuaded that one of ordinary skill in the art would not have formed an open circuit in the cell in view of the cited references. Accordingly, we sustain the Examiner's rejection of claim 3 and the claims grouped with claim 3, claims 1, 2, 4-13, 16-19, 21, 22, 25-28, 30, 31, and 34-37.

With respect to claim 4, Appellant argues that none of the references teaches the intermixing of a phase change material and conductive line to form an OTP structure. (App. Br. 13). The Examiner suggests that Fricke's discussion of changing germanium telluride from a semiconducting state to a metallic state is equivalent to causing the phase change material and the conductor to mix. We do not agree with the Examiner's reasoning, as supplied in the Answer. (Ans. 8-9).

Rather, we agree with the Examiner formulation as found in the rejection of claim 4 and other like claims. (Ans. 6). Fricke refers to local heating that occurs in the storage material. (FF 4). Such heating would necessarily cause the mixing of the phase change material and the conductor, at least at the interface of those materials. And while Appellant is correct that the Specification provides for a much greater degree of mixing, (Reply Br. 3), such as illustrated in Fig. 4 of the Specification, claim 4 is broader and provides for nothing more than some degree of the mixing of the phase change material and the conductor. Thus, based on a reasonable interpretation of claim 4, we find that that the combination of Fricke, Madurawe, Lung, and Purdham renders that claim obvious. Accordingly, we sustain the Examiners rejection of claim 4 and the claims grouped with claim 4, claims 14, 24, and 33.

With respect to claim 11, Appellant argues that "[n]one of the cited references suggest packaging a write pin to make it inaccessible." (App. Br. 14). The Examiner finds that Purdham teaches that a write interface may be inaccessible to the user, except via known circuitry, and that this is the equivalent to making the write pin inaccessible to the user. (Ans. 9). Appellant argues that Purdham teaches that a write pin is accessible to user access. (Reply Br. 4). We agree with the Examiner.

We do not find persuasive Appellant's argument that just because special circuitry is needed, that does not make the write pin inaccessible to the user. (Reply Br. 4). The Specification makes clear that "[t]he pin 23 may still be contacted by the manufacturer before packaging but cannot readily be contacted or used by the user after packaging." (Spec. 4:7-9). We find that the need for certain circuitry (FF 7) would make write access of Purham inaccessible to the user, as the terms found in claim 11 are discussed in the Specification. We find that the combination of Fricke, Madurawe, Lung, and Purdham renders claim 11 obvious as provided in the rejection of that claim. Accordingly, we sustain the Exminers rejection of claim 11 and the claims grouped with claim 4, claims 20, 29, and 38.

CONCLUSION

In summary, we find no error in the rejection of the representative claims and sustain their rejection and the rejection of the remaining claims that fall with the representative claims.

DECISION

The Examiner's rejection of claims 1-38 before us on appeal is 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).

AFFIRMED

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