UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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*Ex parte* CHRISTIAN R. BONHOTE,
HEATHER K. DeSIMONE, JOHN W. LAM,
MATTHEW W. LAST, EDWARD HIN PONG LEE,
and IAN R. McFADYEN

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Appeal 2008-1073
Application 10/856,090
Technology Center 1700

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Decided: July 28, 2008

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Before ADRIENE LEPIANE HANLON, CAROL A. SPIEGEL, and LINDA M. GAUDETTE, *Administrative Patent Judges*.

HANLON, *Administrative Patent Judge*.

DECISION ON APPEAL

A. STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134 from an Examiner's final rejection of claims 1-27, all of the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b). We AFFIRM-IN-PART.

The Examiner finally rejected claims 1-27 under 35 U.S.C. § 103(a) as being unpatentable over Fontana.[1] Final 2-5.[2]

B. ISSUE

The sole issue on appeal is whether the Appellants have shown that the Examiner reversibly erred in rejecting claims 1-27 under 35 U.S.C. § 103(a) as being unpatentable over Fontana.

C. FINDINGS OF FACT

The following findings of fact are believed to be supported by a preponderance of the evidence. Additional findings of fact as necessary appear in the Analysis portion of the opinion.

1. Appellants' invention

The Appellants' invention relates to patterned electroplating of films with a large stress. Spec. 1, para. [0001].

In one embodiment of the invention, an electroplated film is deposited over a substrate with a plating frame pattern that includes a plating field defined by a plurality of individual features. The individual features are said to reduce the contiguous area of the film thereby reducing the delamination force at any location on the plating filed. Spec. 3, para. [0010].

Appellants' Figure 3 illustrates a substrate that has been electroplated in accordance with an embodiment of the invention. Spec. 4, para. [0014].

[1] US Patent 6,131,271 issued to Fontana, Jr. et al. on October 17, 2000 ("Fontana").
[2] Final Office Action mailed August 11, 2006 ("Final").

Appellants' Figure 3 is reproduced below:

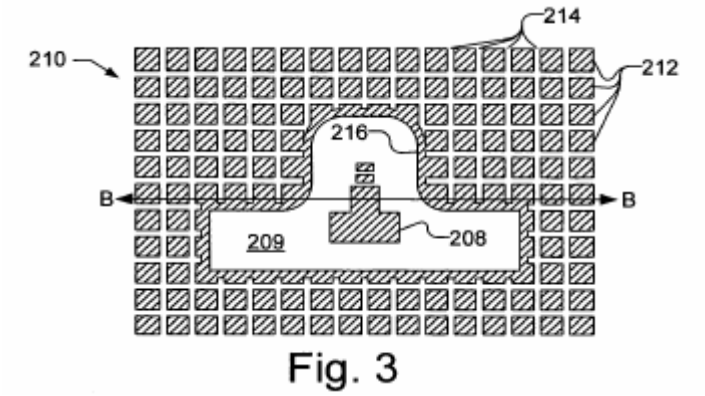


Figure 3 depicts a substrate that has been electroplated.

According to the Appellants, a substrate is covered with an adhesion layer, a seed layer, and a plated layer of high moment material. The plated layer forms a feature **208** and a surrounding plating field **210**. Spec. 5, para. [0021].

The feature **208** is permanent, while the plating field **210** may be removed. The plating field **210** is formed from a plurality of individual features **212** that are separated from each other by non-plated gaps **214**. The use of a plating field **210** formed from individual features **212** is said to reduce the delamination force on the plating field **210**. Spec. 5, para. [0023].

The Appellants disclose that the structure illustrated in Figure 3 may be used in the production of a write head or other devices in which electroplating is desirable. Spec. 5, para. [0022].

2. <u>Claimed subject matter</u>

Claims 1 and 13 are the only independent claims on appeal. They read as follows:

1. A method comprising:
providing a substrate;
depositing a seed layer over the substrate; and

> electroplating over the seed layer a plated layer with a frame pattern having at least one permanent feature surrounded by a plurality of individual features that define a plating field for the at least one permanent feature.
>
> 13. A structure comprising:
> a substrate;
> a seed layer disposed over the substrate; and
> a mask disposed over the seed layer, the mask defining a frame pattern having at least one permanent feature and a surrounding plating field, the plating field comprised of a plurality of individual features associated with the permanent feature.

App. Br., Claims Appendix.

3. <u>Fontana</u>

Fontana discloses a magnetic head comprising a write head portion and a read head portion. Fontana 7:61-64.

Fontana Figure 7 illustrates a wafer substrate **200** having rows and columns of slider sites **202** where magnetic head assemblies are to be fabricated by thin film plating and deposition techniques. Fontana 8:54-57. Fontana Figure 7 is reproduced below:

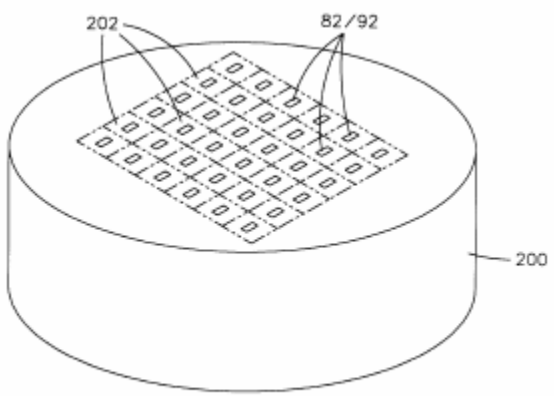


FIG. 7

Figure 7 depicts a wafer substrate.

In Figure 7, magnetic head assemblies have been partially completed by the construction of multiple second shield/first pole piece layers **82**/**92**. Fontana 8:57-59.

Fontana discloses that second shield/first pole piece layers **82**/**92** are included in the write head portion of a magnetic head. Fontana 8:6-20.

Fontana Figure 10 illustrates a portion of the wafer substrate wherein the second shield/first pole piece material layer has been separated at each second shield/first pole piece layer **82**/**92** and at the perimeter of each slider site **202**. Fontana 6:24-28. Fontana Figure 10 is reproduced below:

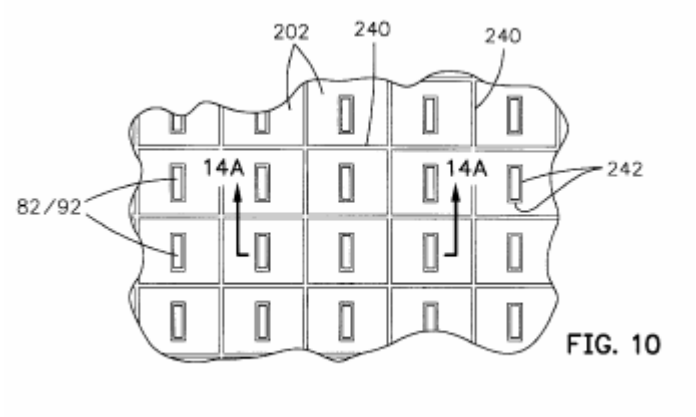


Figure 10 depicts a portion of the wafer substrate.

Fontana describes the invention as follows:

> In the present invention the large expanse of the second shield/first pole piece material layer in the field about the second shield/first pole piece layer **82**/**92** is separated into multiple segments wherein each segment preferably is located at a respective slider site **202** and is implemented by a separation at **240** around the entire outside perimeter of each slider site. Accordingly, in the rows and columns of slider sites the interior slider sites share a common perimeter with four other slider sites, slider sites at the edges of the rows and columns of slider sites share a perimeter with three slider sites

> while the slider sites at the corners of the rows and columns slider sites share a common perimeter with two slider sites.

Fontana 10:66-11:11.

The discontinuities or separations in the second shield/first pole piece material layer in the field regions about the second shield/first pole piece layers at each slider site prevents delamination of the second shield/first pole piece material layer from the underlying layer. Fontana 5:9-21, 11:21-29.

D. ANALYSIS

1. Claim construction

Claim 1 recites "a frame pattern having at least one permanent feature surrounded by a plurality of individual features that define a plating field for the at least one permanent feature." Similarly, claim 13 recites "a frame pattern having at least one permanent feature and a surrounding plating field, the plating field comprised of a plurality of individual features associated with the permanent feature."

In order to provide antecedent basis for "the permanent feature" recited in claim 13, we interpret "the permanent feature" as referring to the previously recited "at least one permanent feature." Thus, we interpret claim 13 as reciting a "plating field comprised of a plurality of individual features associated with the [at least one] permanent feature."

The phrase "at least one" includes one or more than one. Therefore, interpreting claim 1 as broadly as its terms reasonably allow, we interpret claim 1 as permitting a plurality of individual features to define a plating field for multiple permanent features, i.e., "at least one permanent feature." Similarly, we interpret claim 13 as permitting a plurality of individual features to be associated with multiple permanent features. *In re Zletz*, 893

F.2d 319, 321 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow.").

2. Claim 1

The Examiner found that Fontana discloses a method of electroplating a substrate with a frame pattern having at least one permanent feature **82**/**92**[3] surrounded by a plurality of individual features **202**.[4] Ans. 3[5]; Fontana Figure 10. The Examiner found that the plurality of individual features **202** define a plating field. Ans. 6.

In contrast, the Appellants argue that Fontana discloses a number of separate frame patterns, each of which includes a permanent feature **82**/**92** surrounded by a single feature **202** that defines the plating field for the permanent feature **82**/**92**. App. Br. 10.[6] The Appellants refer to a modified version of Fontana Figure 10 to illustrate their point. Modified Fontana Figure 10 is reproduced below:

[3] Permanent feature **82**/**92** is also referred to as second shield/first pole piece layer **82**/**92** in this opinion.
[4] Individual features **202** are also referred to as slider sites **202** in this opinion.
[5] Examiner's Answer mailed June 7, 2007.
[6] Appeal Brief dated February 27, 2007.

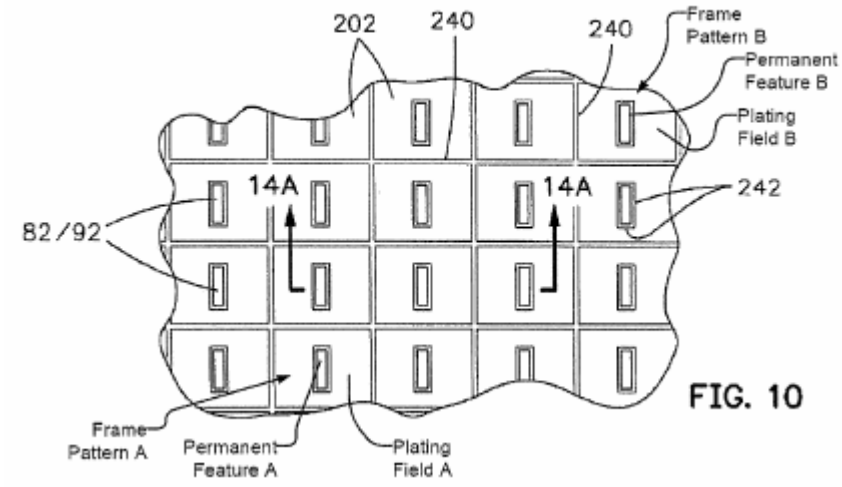


Figure 10 depicts a portion of a wafer substrate.

According to the Appellants, the single feature identified as Plating Field B defines the plating field for the Permanent Feature B in Frame Pattern B; it does not define the plating field for Permanent Feature A in Frame Pattern A. App. Br. 11.

At issue in this appeal is the meaning of the term "field" or "plating field" in Fontana. According to Fontana, Figure 10 shows "the second shield/first pole piece material layer *in the field* . . . segmented into a grid . . ." (emphasis added). Fontana 11:14-16. Fontana also discloses:

> [T]he large expanse of the second shield/first pole piece material layer *in the field* . . . is separated into multiple segments wherein each segment preferably is located at a respective slider site **202** and is implemented by a separation at **240** around the entire outer perimeter of each slider site. [Emphasis added.]

Fontana 10:66-11:5.

Based on the teachings of Fontana, we find that the plating field in Fontana is segmented into a grid or frame pattern as illustrated in Figure 10. We further find that this grid is composed of a plurality of individual

features **202** that surround multiple permanent features **82**/**92**. These individual features **202** define a plating field for multiple permanent features **82**/**92**. Thus, we find that Fontana discloses "a frame pattern having at least one permanent feature surrounded by a plurality of individual features that define a plating field for the at least one permanent feature" as required by claim 1.

The Appellants argue that if a plurality of permanent features **82**/**92** were viewed as the "at least one permanent feature" in the frame pattern of Fontana, then the associated plurality of individual features **202** would be intermeshed with, and would not surround, the permanent features as required by claim 1. Reply Br. 2.[7]

The Appellants' argument is not persuasive of reversible error. Although the plurality of individual features **202** may be intermeshed with permanent features **82**/**92**, they nonetheless surround the permanent features. Compare Fontana Figure 10 with Appellants' Figure 3.

Finally, referring to portions of paragraphs [0022] and [0029] of the Appellants' Specification, the Appellants argue that the term "frame pattern" in claim 1 does not include a plurality of permanent and individual features as urged by the Examiner. Reply Br. 2-3.

The Appellants' argument appears to be directly at odds with the express language of claim 1. *See* claim 1 (reciting "at least one permanent feature" and "a plurality of individual features"). Moreover, the portions of the Specification relied on by the Appellants do not expressly exclude a frame pattern having a plurality of individual features and more than one permanent feature.

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[7] Reply Brief dated July 30, 2007.

For the reasons set forth above, the Appellants have failed to show that the Examiner reversibly erred in rejecting claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Fontana.

Claims 2-12 depend from claim 1. The Appellants have failed to point to any error in the Examiner's findings of fact or conclusion of obviousness as to claims 2-12. Therefore, the Appellants have likewise failed to show that the Examiner reversibly erred in rejecting claims 2-12 under 35 U.S.C. § 103(a) as being unpatentable over Fontana.

3. Claim 13

Again, referring to modified Fontana Figure 10, the Appellants argue that each frame pattern in Fontana (e.g., Frame Pattern A) includes a permanent feature (Permanent Feature A) that is surrounded by a plating field (Plating Field A) comprising a single feature. The Appellants argue that Fontana does not teach or suggest a frame pattern having at least one permanent feature and a surrounding plating field, wherein the plating field comprises a plurality of individual features "associated with" at least one permanent feature. App. Br. 12-13.

As discussed above with respect to the rejection of claim 1, Fontana discloses a frame pattern comprising multiple permanent features **82**/**92** surrounded by a plurality of individual features **202**. The individual features **202** define the plating field for multiple permanent features **82**/**92**. Therefore, it necessarily follows that the plurality of individual features **202** are associated with multiple permanent features **82**/**92**, i.e., at least one permanent feature, as recited in claim 13.

The Appellants have failed to show that the Examiner reversibly erred in rejecting claim 13 under 35 U.S.C. § 103(a) as being unpatentable over Fontana.

Claims 14-25 depend from claim 13. The Appellants have failed to point to any error in the Examiner's findings of fact or conclusion of obviousness as to claims 14-25. Therefore, the Appellants have likewise failed to show that the Examiner reversibly erred in rejecting claims 14-25 under 35 U.S.C. § 103(a) as being unpatentable over Fontana.

4. Claims 26 and 27

Claim 26 depends on claim 1 and recites "there are more individual features in the plurality of individual features that define the plating field than permanent features in the at least one permanent feature." Claim 27 depends on claim 13 and recites "there are more individual features in the plurality of individual features than permanent features in the at least one permanent feature." App. Br., Claims Appendix. We interpret "the plurality of individual features" in claim 27 to be the "plurality of individual features associated with the [at least one] permanent feature" recited in claim 13.

The Appellants argue that Fontana discloses a one-to-one correspondence between permanent features **82**/**92** and individual features **202**. App. Br. 13. We agree. *See, e.g.,* Fontana Figure 10.

The Appellants have shown that the Examiner reversibly erred in rejecting claims 26 and 27 under 35 U.S.C. § 103(a) as being unpatentable over Fontana.

E. DECISION

The rejection of claims 1-25 under 35 U.S.C. § 103(a) as being unpatentable over Fontana is affirmed.

The rejection of claims 26 and 27 under 35 U.S.C. § 103(a) as being unpatentable over Fontana is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a) (2008).

AFFIRMED-IN-PART

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