

The opinion in support of the decision being entered today was **not** written for publication in a law journal and is **not** binding precedent of the Board.

Paper No. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GUY BLALOCK and PHILLIP G. WALD

Appeal No. 2000-0721
Reissue Application No. 08/628,287

ON BRIEF

Before HAIRSTON, BARRETT, and BARRY, Administrative Patent Judges.

BARRY, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the rejection of claims 1-83. We reverse.

BACKGROUND

The invention at issue in this appeal relates to stacked capacitor cells. As dynamic random access memories increase in memory cell density, maintaining sufficient storage capacitance while decreasing cell area is a challenge. A

principal way of increasing such capacitance is through cell structure techniques. Such techniques include three-dimensional cell capacitors such as trenched or stacked capacitors.

A conventional stacked "crown" cell capacitor features upward, spire-like projections, which increase surface area and corresponding capacitance as compared with planar capacitors. More specifically, a semiconductor wafer comprises a bulk substrate, word lines, a field oxide region, and an active area for connection with a capacitor. The wafer further comprises a layer of insulating dielectric through which a desired contact opening is provided to the active area. The contact opening has an elliptical or circular shape circumscribed by sidewalls. The sidewalls are typically smooth and straight. A layer of conductive material, such as conductively doped polysilicon, is deposited atop the wafer and within the contact opening. The deposited polysilicon provides a storage node poly for formation of a capacitor plate.

The inventive construction provides a striated surface for deposit of conductively doped polysilicon atop a wafer and within a contact opening. Such a surface maximizes surface area in both external and internal portions of the deposited polysilicon. Increasing surface area, in turn, increases capacitance.

Claim 53, which is representative for our purposes, follows:

53. A stacked capacitor construction formed within a semiconductor substrate comprising:

a layer of insulating dielectric material located on the semiconductor substrate having at least one contact opening therein, the contact opening having striations in the sidewall;

an electrically conductive storage node, the storage node having external sidewalls, the external sidewalls each having a surface thereon to maximize surface area and corresponding capacitance, the surfaces of the external side walls including striations;

a dielectric layer provided over the storage node and its associated external sidewalls, the dielectric layer including striations; and

an electrically conductive layer provided over the

dielectric layer, the surface of the electrically conductive layer including partial striations.

Claims 5-83 stand rejected under 35 U.S.C. § 112, ¶ 1, as lacking a written description. Claims 1-83 stand rejected under 35 U.S.C. § 251 as lacking an error correctable by reissue of the original patent. Claims 5-83 stand rejected under 35 U.S.C. § 112, ¶ 2, as indefinite. Rather than repeat the arguments of the appellants or examiner in toto, we refer the reader to the briefs and answer for the respective details thereof.

OPINION

In deciding this appeal, we considered the subject matter on appeal and the rejection advanced by the examiner. Furthermore, we duly considered the arguments and evidence of the appellants and examiner. After considering the totality of the record, we are persuaded that the examiner erred in rejecting claims 1-83. Accordingly, we reverse. Our opinion addresses the following issues:

- written description of claims 5-83

- error correctable by reissue
- definiteness of claims 5-83.

Written Description of Claims 5-83

We begin by noting the following principle: "the PTO has the initial burden of presenting evidence or reasons why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims."

In re Gosteli, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989)(quoting In re Wertheim, 541 F.2d 257, 263, 191 USPQ 90, 97 (CCPA 1976)). With these principles in mind, we consider the examiner's rejection and the appellants' argument.

The examiner alleges, "[t]he only sidewalls including 'striations' disclosed in the specification appear to have 'longitudinally extending striations'.... [S]uch 'striations' which are *not* 'longitudinally extending' would be new matter." (Examiner's Answer at 4.) The appellants argue, "the stacked capacitor construction of the invention is described

structurally in the specification and illustrated in the drawings as having 'striations', not merely 'longitudinally extending striations'." (Reply Br. at 13.)

Claims 5-8, 13-16, 21-36, 53-56, and 65-83 each specifies in pertinent part the following limitations: "surfaces of the external sidewalls including striations" Similarly, claims 9-12 each specifies in pertinent part the following limitations: "surfaces of the rising external sidewalls including striations" Further similarly, claims 17-20 each specifies in pertinent part the following limitations: "surfaces of the external sidewalls including striated sidewalls" Also similarly, claims 37-40 each specifies in pertinent part the following limitations: "surfaces of the upwardly rising external sidewalls including striations" Similarly, claims 41-44 each specifies in pertinent part the following limitations: "surfaces of the external sidewalls including complementary striations" Further similarly, claims 45-48 each specifies in pertinent part the following limitations: "surfaces of the rising external sidewalls including complementary striations" Also similarly,

claims 49-52 each specifies in pertinent part the following limitations: "surfaces of the upwardly rising external sidewalls including complimentary striations" Similarly, claims 57-64 each specifies in pertinent part the following limitations: "surfaces of the upwardly raised external sidewalls including striations" Accordingly, the limitations of claims 5-83 require striations in the surfaces of external sidewalls.

The examiner fails to show that the limitations lack a written description. "To fulfill the written description requirement, the patent specification 'must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed.'" Gentry Gallery, Inc. v. Berkline Corp., 134 F.3d 1473, 1479, 45 USPQ2d 1498, 1503 (Fed. Cir. 1998) (quoting Gosteli, 872 F.2d at 1012, 10 USPQ2d at 1618). Fulfillment of the requirement is adjudged "as of the filing date" of the associated patent application. Vas-Cath, Inc. v. Mahurkar, 935 F.2d at 1566, 19 USPQ2d at 1119.

Here, the original specification, which includes the original claims, discloses striations in the surfaces of external sidewalls. Specifically, "a capacitor contact opening ha[s] grooved striated sidewalls and thereby defining female capacitor contact opening striations;" col. 3, ll. 10-12, "electrically conductive material filling the grooved striations of the capacitor contact opening thereby defining striated external conductive material sidewalls within the capacitor contact opening which are male complementary in shape to the female capacitor contact opening striations;" id. at ll. 16-21, and "exposed striated sidewalls" Id. at ll. 30-31.

In view of this disclosure, we are not persuaded that persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims. The examiner fails to meet his initial burden. Therefore, we reverse the rejection of claims 5-83 as lacking a written description. Next, we address the error correctable by reissue.

Error Correctable by Reissue

We begin by noting that 35 U.S.C. § 251, ¶ 1, specifies in pertinent part the following remedy.

Whenever any patent is, through error without any deceptive intention, deemed wholly or partly inoperative or invalid, by reason of a defective specification or drawing, or by reason of the patentee claiming more or less than he had a right to claim in the patent, the Commissioner shall, on surrender of such patent ... reissue the patent for the invention disclosed in the original patent

"[T]he whole purpose of the [reissue] statute, so far as claims are concerned, is to permit limitations to be added to claims that are too broad or to be taken from claims that are too narrow.'" In re Weiler, 790 F.2d 1576, 1580, 229 USPQ 673, 675 (Fed. Cir. 1986) (quoting In re Handel, 312 F.2d 943, 948, 136 USPQ 460, 464 (CCPA 1963)). "That is what the statute means in referring to 'claiming more or less than he had a right to claim.'" Handel, 312 F.2d at 948, 136 USPQ at 464. With these principles in mind, we consider the examiner's rejection.

The examiner asserts, "[a]n invention which comprises 'striations', which are not 'longitudinally extending', is not an 'invention disclosed in the original patent.' 35 U.S.C. 251. Under 35 U.S.C. 112, applicant does not appear entitled to broader claims 5-83" (Examiner's Answer at 4.) In other words, the examiner's rejection of claims 1-83 under 35 U.S.C. § 251 relies on his allegation that claims 5-83 lack a written description. Because we already rejected the allegation, we are not persuaded that the appellants failed to satisfy the error requirement of 35 U.S.C. § 251. Therefore, we reverse the rejection of claims 1-83 as lacking an error correctable by reissue of the original patent. Next, and last, we address the definiteness of claims 5-83.

Definiteness of Claims 5-83

We begin by noting the following principles. "The test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification. If the claim read in light of the specification reasonably apprise[s] those skilled in the art

of the scope of the invention, Section 112 demands no more."

Miles Labs., Inc. v.

Shandon Inc., 997 F.2d 870, 875, 27 USPQ2d 1123, 1126 (Fed. Cir. 1993) (internal citations omitted). Furthermore, a claim should not be denied "solely because of the type of language used to define the subject matter for which patent protection is sought." In re Swinehart, 439 F.2d 210, 212 n.4, 169 USPQ 226, 228 n.4 (CCPA 1971). With these principles in mind, we consider the examiner's rejections on the grounds of indefiniteness and the appellants' arguments.

First, the examiner alleges, "[i]n claims 13, 17, 21, 25, 29, 33, 37, 53, 57, 66 and 67 ... the scope of the relationship of the 'contact opening' to the 'electrically conductive storage node' is unclear. Compare claim 5." (Examiner's Answer at 4-5.) The appellants argue, "the relationship between 'contact opening 54' and 'the electrically conductive storage node, conductive material 60,' is clearly set forth in the specification at column 4, lines 51 through 68 continuing through column 6, lines 1 through 4, and in drawing FIGS. 7 through 13. The contact opening 54 in insulating dielectric 52 located on substrate 42 clearly has

the electrically conductive storage node, conductive material 60, located therein." (Reply Br. at 14.)

Claims 13-40, 53-60, 66, and 67 each specifies in pertinent part the following limitations: "at least one contact opening ...; an electrically conductive storage"

The examiner fails to show that the limitations are indefinite. "Even if ... claims are .. broader than they otherwise would be, breadth is not to be equated with indefiniteness, as we have said many times." In re Miller, 441 F.2d 689, 693, 169 USPQ 597, 600 (CCPA 1971).

Here, although the relationship between the claimed electrically conducting storage and the claims contact opening may not be recited in claims 13-40, 53-60, 66, and 67, the omission is a matter of breadth, not of indefiniteness. The specification discloses that "[e]lectrically conductive material **60** fills grooved striations **58** of capacitor contact opening **54**." Col. 4, ll. 56-57. When read in light of the

specification, one skilled in the art would understand that the claimed electrically conductive storage fills grooved striations of the claimed contact opening. We demand no more.

Second the examiner alleges, "in claims 53, 57, 61, 66-68, 72, 76 and 80, the scope of 'partial' striations relative to what is unclear." (Examiner's Answer at 5.) The appellants argue, "[t]he only the claimed element having partial striations is the 'electrically conductive layer provided over the dielectric layer ... including partial striations' which is illustrated with striations in drawing FIG. 13 as the layer 66 which only has striations partially translated into the outer surfaces thereof due to the increasing thickness and corresponding smoothing effect by subsequent layers." (Reply Br. at 14.)

Claims 53-64, 66, and 68-83 each specifies in pertinent part the following limitations: "dielectric layer including striations; and an electrically conductive layer provided over the dielectric layer, the surface of the electrically conductive layer including partial striations." Similarly,

claims 67 specifies in pertinent part the following limitations: "an electrically conductive layer provided over the dielectric layer, a portion of the surface of the electrically conductive layer including partial striations."

The examiner fails to show that the limitations are indefinite. The specification discloses that "a conformal capacitor cell layer **66** of conductive material, such as conductively doped polysilicon, is conformally deposited atop capacitor dielectric layer **64**. Striations from internal and external surfaces of layer **64** will probably only partially translate to outer surfaces of layer **66** due to the increasing thickness and corresponding smoothing effect imparted by subsequent layers." Col. 5, ll. 22-29. When read in light of the specification, one skilled in the art would understand that the claimed striations on the surface of the electrically conductive layer are partial relative to the claimed striations of the dielectric layer. We demand no more. Therefore, we reverse the rejection of claim 5-83 under 35 U.S.C. § 112.

CONCLUSION

In summary, the rejection of claims 5-83 under 35 U.S.C. § 112, ¶ 1, as lacking a written description is reversed. The rejection of claims 1-83 under 35 U.S.C. § 251 as lacking an error correctable by reissue of the original patent is also reversed. Furthermore, the rejection of claims 5-83 under 35 U.S.C. § 112, ¶ 2, as indefinite is reversed.

REVERSED

KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
LEE E. BARRETT)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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LANCE LEONARD BARRY)	

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