THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GENSHU FUSE and TAKASHI OHZONE

Appeal No. 96-1536
Application 08/136,241[1]

ON BRIEF

Before WILLIAM F. SMITH, METZ and JOHN D. SMITH, ***Administrative Patent Judges***.

METZ, ***Administrative Patent Judge***.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the

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[1] Application for reissue filed October 15, 1993. According to appellants, this Application is a Reissue of Application 07/467,544 filed January 19, 1990, now Patent Number 5,057,444, which issued on October 15, 1991, which is a continuation of Application 07/191,788, now Patent No. 4,918,027 which issued on April 17, 1990, which is a continuation of Application 06/836,514 filed March 5, 1986.

examiner's refusal to allow claims 1 through 3, all the claims remaining in appellants' application for reissue of U.S. Patent 5,057,444, which issued on October 15, 1991.

The appealed subject is directed to a process for the preparation of various semiconductor devices.

Claim 2, which is illustrative of the claimed process, is reproduced below for a more facile understanding of appellants' invention.

> 2. A method of fabricating a trench capacitor comprising:
>
> a step of forming a trench in a semiconductor substrate having a principle [sic, principal] surface, said trench having four sidewalls which extend into said substrate in a direction perpendicular to said principal surface of said semiconductor substrate and which are perpendicular to each other, and said trench having a bottom parallel to said principal surface;
>
> a step of forming an outer electrode including,
>
> (a) a step of positioning said semiconductor substrate in a first position;
>
> (b) a step of implanting ions into a first side-wall of said side-walls of said trench from a direction inclined to a normal to a plane containing said principal surface of said semiconductor substrate;
>
> (c) a step of positioning said semiconductor substrate in a second position which is different from said first position by rotating said semiconductor substrate by 90E about an axis of rotation which is

perpendicular to said principal surface of said semiconductor substrate;

(d) a step of implanting ions of the same type and to the same extent as implanted in the first side-wall into a second side-wall of said side-walls of said trench from said direction inclined to the normal to the plane containing said principal surface of said semiconductor substrate;

(e) a step of positioning said semiconductor substrate in a third position which is different from said first and second positions by rotating said semiconductor substrate by 90E about said rotation axis;

(f) a step of implanting ions of the same type and to the same extent as implanted in said first and second side-walls into a third side-wall of said side-walls of said trench from said direction inclined to the normal to the plane containing said principal surface of said semiconductor substrate;

(g) a step of positioning said semiconductor substrate in a fourth position which is different from said first, second and third positions by rotating said semiconductor substrate by 90E about said rotation axis;

(h) a step of implanting ions of the same type and to the same extent implanted in said first, second and third side-walls into a fourth side-wall of said side-walls of said trench from said direction inclined to the normal to the plane containing said principal surface of said semiconductor substrate;

wherein all of the steps of implanting are carried out such that the extent of implantation and type of ion are such that an outer electrode is thereby formed along said four side-walls of said trench;

a step of forming an insulating layer within the trench along the outer electrode; and

a step of forming an inner electrode within the trench along the insulating layer.

OPINION

The only rejections before us for our consideration are not founded on prior art. Accordingly, there are no references of record which are being relied on by the examiner.

Claim 2 stands rejected under 35 U.S.C. § 112, first paragraph, on the grounds that the subject matter now claimed is not described in appellants' original disclosure. Claims 1 through 3 stand rejected under 35 U.S.C. § 251 on the grounds that there is no "reissuable error" (see page 3 of the Answer).

Because the examiner's rejection under 35 U.S.C. § 251 is founded entirely on the position taken by the examiner with respect to the rejection under 35 U.S.C. § 112, all the rejections stand or fall with the rejection under 35 U.S.C. § 112. We reverse.

The function of the "written description" requirement of 35 U.S.C. § 112, first paragraph, is to ensure that applicants had possession, as of the filing date of the application relied on, of the subject matter later claimed by them. ***In re Blaser***, 556 F.2d 534, 537, 194 USPQ 122, 124, 125

(CCPA 1977). The inquiry into satisfaction of the written description requirement is factual and depends on the nature of the invention and the amount of knowledge imparted to those skilled in the art by the disclosure. ***In re Wertheim***, 541 F.2d 257, 262, 191 USPQ 90, 96 (CCPA 1976). Satisfaction of the "written description" requirement does not require *in ipsis verbis* antecedence in the originally filed application. ***In re Lukach***, 442 F.2d 967, 969, 169 USPQ 795, 796 (CCPA 1971). The question, therefore, is whether the originally filed application would have reasonably conveyed to a person of ordinary skill in the art that applicants invented the subject matter later claimed by them including the limitations in question. ***In re Smythe***, 480 F.2d 1376, 1382, 178 USPQ 279, 284 (CCPA 1973).

As correctly noted by appellants at page 2 of their Reply Brief, the examiner has improperly focused on a process step which has been eliminated from claim 2 rather than focusing on what is *now* being claimed by appellants in amended claim 2. Claim 2, as amended, now describes a method of fabricating a trench capacitor by forming a trench with four

side-walls and a bottom. Subsequently, an outer electrode is formed along said four side-walls in the trench by implanting ions into each side-wall, serially, after rotating the semiconductor 90E with respect to each previous implantation. Thereafter, an insulating layer is formed within the trench along the outer electrode. Finally, an inner electrode is formed within the trench along the insulating layer.

At column 4, lines 47 through 50 of their patent, appellants describe their technique of doping by rotating the semiconductor in planarity four times in 90E increments as useful for doping the side-walls of deep trenches in dynamic RAM cell capacitors. In column 6, lines 20 through 42, appellants describe the preparation of one cell of a dynamic RAM. At lines 27 through 30 of column 6, the formation of a deep trench (68) is described with reference to Figure 9(b). To form n-type regions (72, 74) in the side-walls, which regions form one of the electrodes, each side-wall is, in succession, doped with As+ ions (column 6, lines 30 through 34). In the next step, which step is depicted in Figure 9(c), a thin insulation film (76) is formed on the inner wall of the deep trench (68) and the other electrode (78) is formed by doped polysilicon (column 6, lines 34 through 37). We find

this disclosure clearly describes the subject matter now claimed by appellants in amended claim 2.

We reject the examiner's theory that the rejection under 35 U.S.C. § 112 is mandated by the M.P.E.P. § 1411.02 and ***United States Industrial Chemicals, Inc. v. Carbide & Carbon Chemicals Corp.***, 315 U.S. 668, 53 USPQ 6 (1942). The proper inquiry into satisfaction of the written description requirement is factual and depends, not on what is omitted from an amended claim but, what is now being claimed by the amended claim. Further, the examiner has failed to establish, as was his burden, why the omission of one process step in a multi-step process described in the disclosure as optional (see column 4, lines 64 through column 5, line 2) can be considered to be not described ("new matter").

Moreover, as correctly noted by appellants, the statute has been amended since the decision in *United States Industrial Chemicals, Inc*. and the statute now requires only that the reissue application is for "the invention disclosed in the original patent" 35 U.S.C. § 251 (1997). See ***In re Amos***, 953 F.2d 613, 616-619, 21 USPQ2d 1271, 1273, 1274 (Fed. Cir. 1991); ***In re Hounsfield***, 699 F.2d 1320, 216 USPQ 1045

(Fed. Cir. 1983).

Finally, we recognize that the disclosure at column 6 describing the various embodiments of Figure 9 also includes a step of first etching isolation trenches in the semiconductor substrate. We also recognize that appellants' claim 2 does not recite or require said first etching step. Nevertheless, as a "comprising" claim, claim 2 does not exclude such a step, or any other step not recited. ***In re Baxter***, 656 F.2d 679, 686, 210 USPQ 795, 802 (CCPA 1981).

Accordingly, we hold that appellants' claims 2 is not rendered unpatentable under 35 U.S.C. § 112 and claims 1 through 3 are not unpatentable under 35 U.S.C. § 251. The decision of the examiner is **REVERSED**.

REVERSED

WILLIAM F. SMITH	)	
	)	Administrative Patent Judge)
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ANDREW H. METZ	)	BOARD OF PATENT
Administrative Patent Judge)	)	APPEALS AND
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