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

Paper No. 10

UNITED STATES PATENT AND TRADEMARK OFFICE

_____

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

_____

Ex parte MARK R. VISOKAY, LUIGI COLOMBO, RAJESH KHAMANKAR and MARK A. KRESSLEY

_____

Appeal No. 2001-1550
Application 09/105,830

_____

ON BRIEF

_____

Before FLEMING, GROSS, and DIXON, **Administrative Patent Judges.**

FLEMING, **Administrative Patent Judge.**

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1 through 14, 16 through 18 and 20, all the claims pending in the application. Claims 15 and 19 have been canceled.

The invention relates to semiconductor integrated circuit capacitors. See page 1 of Appellants' specification. Figures 8a through 8o illustrate the steps of an embodiment fabrication method for a DRAM in cross-sectional elevation view at the memory cell array.

See page 11 of Appellants' specification. Figure 8f shows depositing a thin adhesion-promoting layer 824 of Ti-Al-N followed by a bottom electrode layer 826 of platinum. See page 12 of Appellants' specification. Figure 8k shows depositing a capacitor dielectric layer 836 and then depositing a platinum top electrode field plate 838. See page 14 of Appellants' specification.

Independent claim 1 is reproduced as follows:

1. A memory circuit, including a memory cell comprising:

(a) a capacitor including:

a bottom electrode having a conductive adhesion-promoting layer at a first surface;

a storage layer in contact with a second surface of said bottom electrode;

a top electrode in contact with said storage layer;

(b) a transistor comprising first and second terminals and a wordline control terminal; and

(c) a bitline coupled to said first transistor terminal;

said bottom electrode coupled to said second transistor terminal by a plug comprising a barrier adjacent said adhesion-promoting layer, said barrier being thicker than said adhesion-promoting layer.

References

The references relied on by the Examiner are as follows:

Meikle et al. (Meikle) 5,231,306 Jul. 27, 1993

Kashihara et al. (Kashihara)	5,382,817	Jan. 17, 1995
Summerfelt et al. (Summerfelt)	5,609,927	Mar. 11, 1997

Rejections at Issue

Claims 1 and 8 stand rejected under 35 U.S.C. § 102 as being anticipated by Summerfelt or in the alternative claims 1 and 8 stand rejected under 35 U.S.C. § 103 as being obvious over Summerfelt.

Claims 1 through 14, 16 through 18 and 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Summerfelt in view of Meikle and Kashihara.

Rather than repeat the arguments of the Appellants or the Examiner, we make reference to the brief and answer for the respective details thereof.

OPINION

With full consideration being given to the subject matter on appeal, the Examiner's rejections and arguments of the Appellants and the Examiner, for the reason stated **infra**, we reverse the Examiner's rejection of claims 1 and 8 under 35 U.S.C. § 102 and we reverse the Examiner's rejection of claims 1 through 14, 16 through 18 and 20 under 35 U.S.C. § 103.

We first will address the rejection of claims 1 and 8 under 35 U.S.C. § 102.

It is axiomatic that anticipation of a claim under § 102 can be found only if the prior art reference discloses every element of the claim. ***See In re King***, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986) and **Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.**, 730 F.2d 1452, 1458, 221 USPQ 481, 485 (Fed. Cir. 1984).

As pointed out by our reviewing court, we must first determine the scope of the claim. "[T]he name of the game is the claim." ***In re Hiniker Co.,*** 150 F.3d 1362, 1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998). In addition, claims are to be interpreted as the terms reasonably allow. ***In re Zletz,*** 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

Claim 1 recites "[a] capacitor, including: (a) a bottom electrode having a conductive adhesion-promoting layer at a first surface." Claim 11 recites "[a] capacitor, comprising: (a) a bottom electrode having a conductive adhesion-promoting layer made of Ti-Al-N and at a first surface." Claim 17 recites "[a]n electrode structure for a capacitor, comprising: . . . (b) a bottom electrode comprising a conductive adhesion-promoting portion and an oxidation-resistant portion, said adhesion-promoting portion made of Ti-Al-N and contacting said oxidation

barrier of said contact plug." Therefore, all the claims require a conductive adhesion-promoting layer.

Appellants argue that Summerfelt fails to teach this limitation because the adhesion layer 26 becomes a dielectric during processing, and thereby is not a conductive adhesion-promoting layer. See page 3 of Appellant's brief.

The Examiner responds to Appellants' argument stating that Summerfelt's barrier layer 26 is a conductive adhesion-promoting layer because it allows current to pass through regardless of whether the layer is a dielectric or a conductor. See page 4 of Examiner's answer.

Upon our review of Summerfelt, we find that Summerfelt teaches in column 4, lines 40 through 44, that "[e]ven though the adhesion layer 26 becomes a dielectric during processing, it will not appreciably affect the conductivity of device 10 because it is only on the order of 5 to 10 Å in thickness." We find that Summerfelt teaches that the barrier layer 26 is a dielectric and thereby cannot be a conductive adhesion-promoting layer as claimed by Appellants. Therefore, we fail to find that Summerfelt teaches all the limitations as recited in Appellants' claims. Thereby, we will not sustain the rejection of claims 1 and 8 under 35 U.S.C. § 102.

In regard to the rejection by the Examiner that claims 1 and 8 are obvious in view of Summerfelt under 35 U.S.C. § 103, we fail to find that Summerfelt suggests a conductive adhesion-promoting layer. Therefore, we will not sustain this rejection as well.

We now turn to the rejection of claims 1 through 14, 16 through 18 and 20 as being unpatentable over Summerfelt in view of Kashihara and Meikle under 35 U.S.C. § 103. Appellants argue that Summerfelt fails to teach a conductive adhesion-promoting layer as required by all of the claims. Appellants further argue that Kashihara's adhesion layer 353 also will be converted to a dielectric during processing and therefore does not teach or suggest a conductive adhesion-promoting layer. Appellants finally argue that Meikle has a Ti-Al-N layer, but one of ordinary skill in the art would not look to such a layer which is used as a diffusion barrier to substitute for the adhesion layers taught in Summerfelt or Kashihara.

In rejecting claims under 35 U.S.C. § 103, the Examiner bears the initial burden of establishing a ***prima facie*** case of obviousness. ***In re Oetiker,*** 977 F.2d 1443, 1445, 24 USPQ 1443, 1444 (Fed. Cir. 1992). ***See also In re Piasecki***, 745 F.2d 1468,

1472, 223 USPQ 785, 788 (Fed. Cir. 1984). The Examiner can satisfy this burden by showing that some objective teaching in the prior art or knowledge generally available to one of ordinary skill in the art suggests the claimed subject matter. ***In re Fine***, 837, F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the Appellants. ***Oetiker***, 977 F.2d at 1445, 24 USPQ at 1444. ***See also Piasecki***, 745 F.2d at 1472, 223 USPQ at 788.

An obviousness analysis commences with a review and consideration of all the pertinent evidence and arguments. "In reviewing the [E]xaminer's decision on appeal, the Board must necessarily weigh all of the evidence and arguments." ***In re Oetiker***, 977 F.2d at 1445, 24 USPQ2d at 1444. "[T]he Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion." ***In re Lee***, 277 F.3d, 1338, 1344, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002).

Meikle teaches a barrier material for use in preventing interdiffusion of silicon and aluminum at the silicon/aluminum interfaces. See Meikle's abstract as well as column 2, lines 58 through 61. Summerfelt teaches an adhesion layer 26 in order to create an **in situ** dielectric layer on which the inner electrode may adhere. See column 4, lines 19 through 44. Similarly Kashihara teaches an adhesion layer 353 to provide adhesion as well as to provide a barrier to prevent a silicification reaction. See column 9, lines 53 through 65, and column 15, lines 22 through 54.

We fail to find though that Summerfelt or Kashihara is concerned with the same problem of Meikle which is to provide a barrier material for use in preventing interdiffusion of silicon/aluminum at the silicon/alumininum interfaces. Therefore, we fail to find that one of ordinary skill in the art would look to Meikle to substitute the materials used in Meikle for the materials used in Summerfelt or Kashihara for the adhesion layers. Therefore, we fail to find that the Examiner has provided any evidence as to reasons why one of ordinary skill in the art would make the modification as proposed. Therefore, we will not sustain the Examiner's rejection under 35 U.S.C. § 103.

In view of the foregoing, we have not sustained the Examiner's rejection of claims 1 and 8 under 35 U.S.C. § 102 and we have not sustained the Examiner's rejection of claims 1 through 14, 16 through 18 and 20 under 35 U.S.C. § 103.

REVERSED

MICHAEL R. FLEMING Administrative Patent Judge	)	
ANITA PELLMAN GROSS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JOSEPH L. DIXON Administrative Patent Judge	)	

MRF:pgg

Texas Instruments Incorporated
P.O. Box 655474, M/S 3999
Dallas, TX 75265