UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte THORSTEN KAMMLER, KARSTEN WIECZOREK,
and AUSTIN FRENKEL

Appeal 2007-2101
Application 10/859,552
Technology Center 2800

Decided: September 5, 2007

Before BRADLEY R. GARRIS, CHUNG K. PAK, and
CHARLES F. WARREN, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 the final rejection of claims 18-22. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 6(b).

We AFFIRM.

INTRODUCTION

Appellants claim a method of forming a field effect transistor that comprises, in relevant part, the following steps: (1) patterning a layer stack

comprising a gate insulation layer, a polysilicon layer and a cap layer to form a gate electrode having a cap layer, (2) forming silicide regions comprising a first metal in said drain and source regions, and (3) exposing the top of the gate electrode (i.e., removing the cap layer), and forming a nickel silicide/cobalt silicide layer stack region in said gate electrode (claim 18).

Claim 18 is illustrative:

18. A method of forming a field effect transistor, the method comprising:

forming a layer stack including at least a gate insulation layer, a polysilicon layer and a cap layer above a silicon region formed on a substrate;

patterning said layer stack to form a gate electrode having a top surface covered by at least said cap layer;

forming a drain and a source region adjacent to said gate electrode;

forming silicide regions comprising a first metal in said drain and source regions;

exposing said top surface of said gate electrode; and

forming a nickel silicide/cobalt silicide layer stack region in said gate electrode.

The Examiner relies on the following prior art references as evidence of unpatentability:

Yu	US 6,376,320 B1	Apr. 23, 2002
Maex	US 2002/01581170 A1	Oct. 17, 2002
Wieczorek	US 6,620,718 B1	Sep. 16, 2003

The rejection as presented by the Examiner is as follows:

1. Claims 18-22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Maex in view of Yu or Wieczorek.

Appellants argue claim 18 only. Accordingly, claims 19-22, which directly or ultimately depend from claim 18, stand or fall with claim 18.

OPINION

Appellants argue that claim 18 requires that the metal used to form "silicide regions comprising a first metal in said drain and source regions" is different than the nickel and cobalt metals used to form the "nickel silicide/cobalt silicide layer stack region" formed on the gate electrode (Br. 4 and 5). Appellants further argue that the Examiner used hindsight in modifying Maex's method of forming a gate electrode on a semiconductor to arrive at the claimed invention (Br. 5 and 6).

We have considered all of Appellants' arguments and are unpersuaded for the reasons below.

The Examiner states that the claims do not require that the "first metal" is different than the nickel and cobalt metals used to form the "nickel silicide/cobalt silicide formed on the gate electrode (Answer 5). We agree.

During examination, "claims … are to be given their broadest reasonable interpretation consistent with the specification, and … claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364, 70 USPQ2d 1827, 1830 (Fed. Cir. 2004). ""Reading a claim in light of the specification," to thereby interpret limitations explicitly recited in the claim, is a quite different thing from "reading limitations of the specification into a claim," to thereby narrow the scope of the claim by implicitly adding *disclosed* limitations which have no

express basis in the claim." *In re Prater*, 415 F.2d 1393, 1404, 162 USPQ 541, 550 (CCPA 1969).

Applying the broadest reasonable interpretation standard to claim 18, the Examiner properly construes the claim features, "forming silicide regions comprising a first metal in said drain and source regions" and "forming a nickel silicide/cobalt silicide layer stack region in said gate electrode," as not requiring different metals to form the silicides (Answer 5). Plainly, Appellants' claims do not require that the "first metal" used to form the silicide regions on the drain and source regions is different than the metal used to form the "nickel silicide/cobalt silicide layer stack region."

Appellants argue that the Specification at page 9, lines 9-16 and page 14, lines 5-12 indicate that different metals are used to form the silicide regions in the source and drain regions and the silicide in the gate electrode such that the argued claim features should be construed as requiring different metals (Br. 4 and 5). However, Appellants' claim construction would have us improperly read limitations into the claim that have no express basis in the claim. *Prater*, 415 F.2d at 1404-05, 162 USPQ at 550-51.

Additionally, as the Examiner noted both Yu and Wieczorek disclose that it is known in the art to use different metals to form the silicide layer in the drain and source regions and in the gate electrode (Answer 5; Yu, col. 7, ll. 45-47; Wieczorek, col. 6, ll. 51-54; col. 7, ll. 1-5). Therefore, even if the claim is construed as argued by Appellants, the Yu or Wieczorek disclosures would render obvious a claim construction that requires the "first metal" used to form the silicide material in the source and drain regions to be different than the nickel and cobalt used to form the silicide region in the gate electrode.

Regarding Appellants' argument that the Examiner has not identified any source of motivation for modifying the disclosure of Maex to arrive at Appellants' claimed invention (Br. 5 and 6), the Examiner has provided motivation directly from the references. Specifically, the Examiner stated that it would have been obvious to use a cap layer as taught by either Yu or Wieczorek in Maex's siliciding process "to independently optimize the silicide thicknesses of the gate and source/drain regions" (Answer 4). The Examiner further states that Yu and Wieczorek provide motivation for using a cap layer and separate siliciding steps in the gate electrode and in the source and drain regions to produce a relatively thick gate silicide having a lower gate resistance, and an increased switching speed, while also producing a relatively shallow source/drain silicide that minimizes unwanted short channel effects (Answer 4).

The Examiner's motivation for the combination of Yu's or Wieczorek's cap and separate siliciding steps with Maex's method of forming a nickel/cobalt silicide layers on transistor gates is taken directly from the Wieczorek and Yu disclosures (Wieczorek, col. 7, ll. 16-27; Yu, col. 8, ll. 19-22, 44-61). *In re Rouffet*, 149 F.3d 1350, 1357-58, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998). Appellants have not rebutted the Examiner's motivation for the combination of Maex in view of Yu or Wieczorek. Accordingly, Appellants' argument regarding lack of motivation for the combination of Maex in view of Yu or Wieczorek is not persuasive.

For the above reasons, we affirm the Examiner's § 103(a) rejection of claims 18-22 over Maex in view Yu or Wieczorek.

DECISION

The Examiner's decision 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

clj

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