EXHIBIT 17

US006566214B1

(12) **United States Patent**
Lyons et al.

(10) Patent No.: **US 6,566,214 B1**
(45) **Date of Patent:** **May 20, 2003**

(54) **METHOD OF MAKING A SEMICONDUCTOR DEVICE BY ANNEALING A METAL LAYER TO FORM METAL SILICIDE AND USING THE METAL SILICIDE AS A HARD MASK TO PATTERN A POLYSILICON LAYER**

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(73) Assignee: **Advanced Micro Devices, Inc.**, Sunnyvale, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/047,036**

(22) Filed: **Jan. 17, 2002**

(51) Int. Cl.^{7} **H01L 21/3213**; H01L 21/336

(52) U.S. Cl. **438/305**; 438/592; 438/655; 438/682; 438/683

(58) Field of Search 438/301, 303, 438/306, 586, 592, 595, 648, 649, 655, 682, 683, 305

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Assistant Examiner—Stephen W. Smoot
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(57) **ABSTRACT**

A method of making a semiconductor device is provided. A polysilicon layer is formed over a substrate and a metal layer is formed on the polysilicon layer. The metal layer and the polysilicon layer are annealed to form a metal silicide layer on the polysilicon layer. The metal silicide layer is patterned and the polysilicon layer is then patterned using the patterned metal silicide layer as a mask. The patterned metal silicide and polysilicon layers may be used as a gate electrode of a MOSFET.
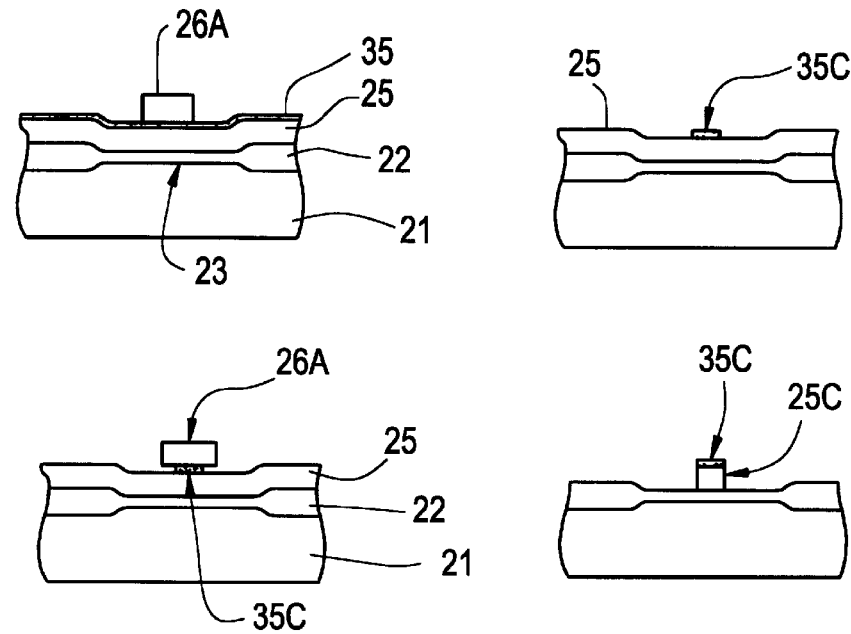
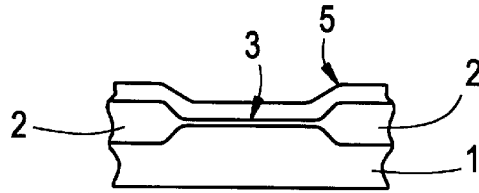**28 Claims, 5 Drawing Sheets**

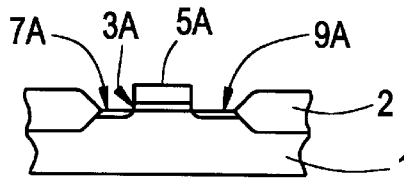# FIG. 1A
PRIOR ART

FIG. 1B
PRIOR ART

FIG. 1C
PRIOR ART
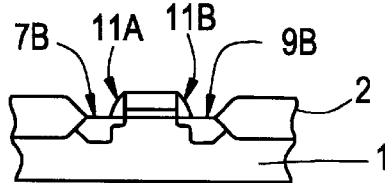
FIG. 1D
PRIOR ART
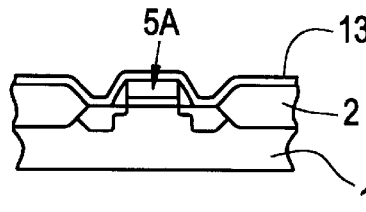
FIG. 1E
PRIOR ART
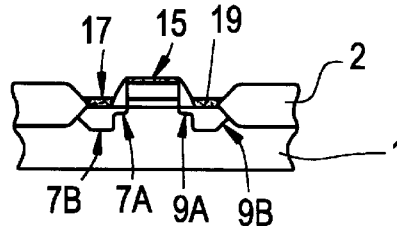
FIG. 2A
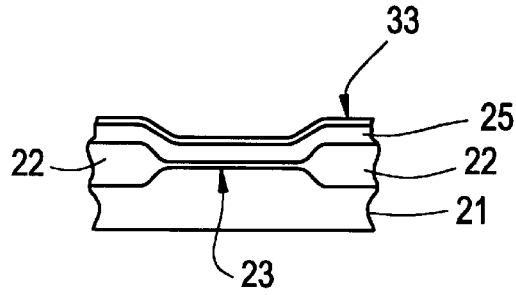
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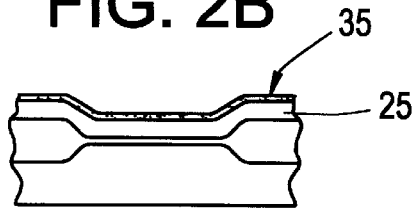
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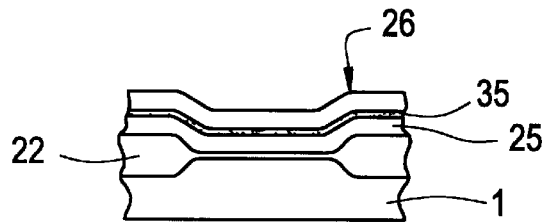
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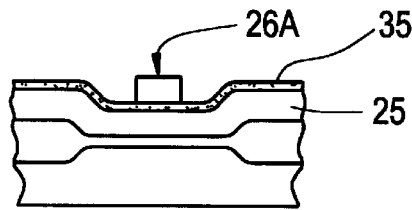
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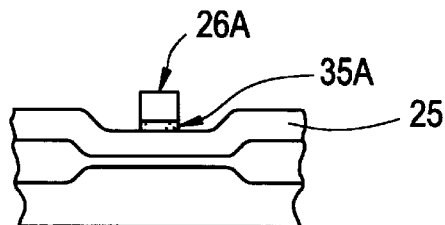
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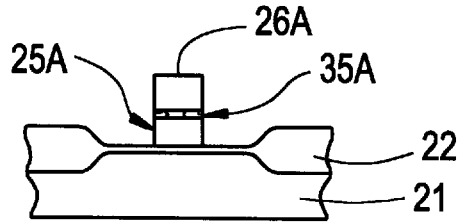
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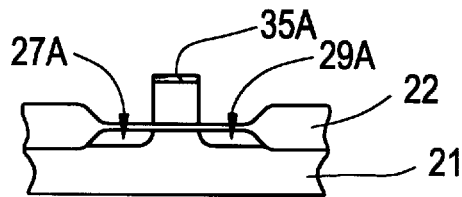
FIG. 2H

FIG. 2I

FIG. 2J

DOCKET ALARM
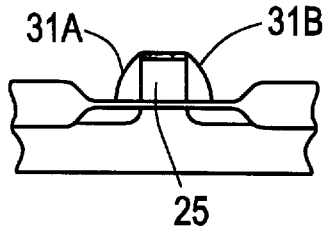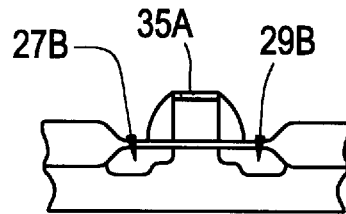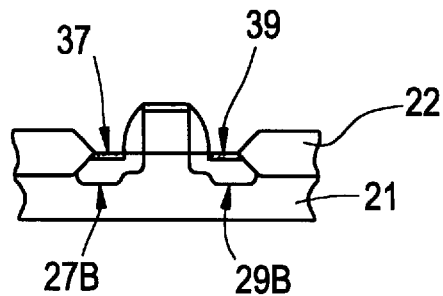
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