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# United States Patent [19]

Bergemont

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[45] Date of Patent: * Dec. 6, 1994

[54] **METHOD OF FABRICATING FIELD OXIDE ISOLATION FOR A CONTACTLESS FLASH EPROM CELL ARRAY**

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[73] Assignee: **National Semiconductor Corporation**, Santa Clara, Calif.

[ * ] Notice: The portion of the term of this patent subsequent to Aug. 31, 2010 has been disclaimed.

[21] Appl. No.: **9,330**

[22] Filed: **Jan. 26, 1993**

**Related U.S. Application Data**

[62] Division of Ser. No. 687,105, Apr. 18, 1991, abandoned.

[51] **Int. Cl.**[5] ..... **H01L 21/70**

[52] **U.S. Cl.** ..... **437/52;** 437/43; 437/48

[58] **Field of Search** ..... 437/43, 48, 52

[56] **References Cited**

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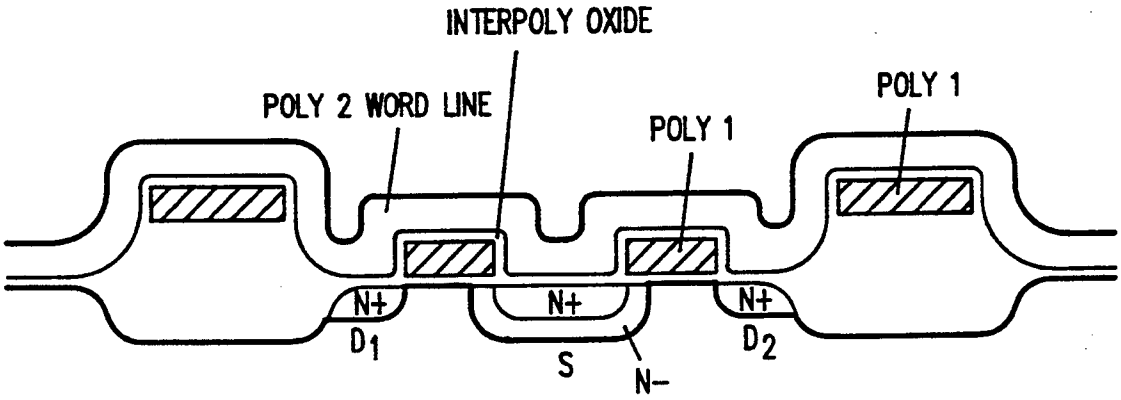
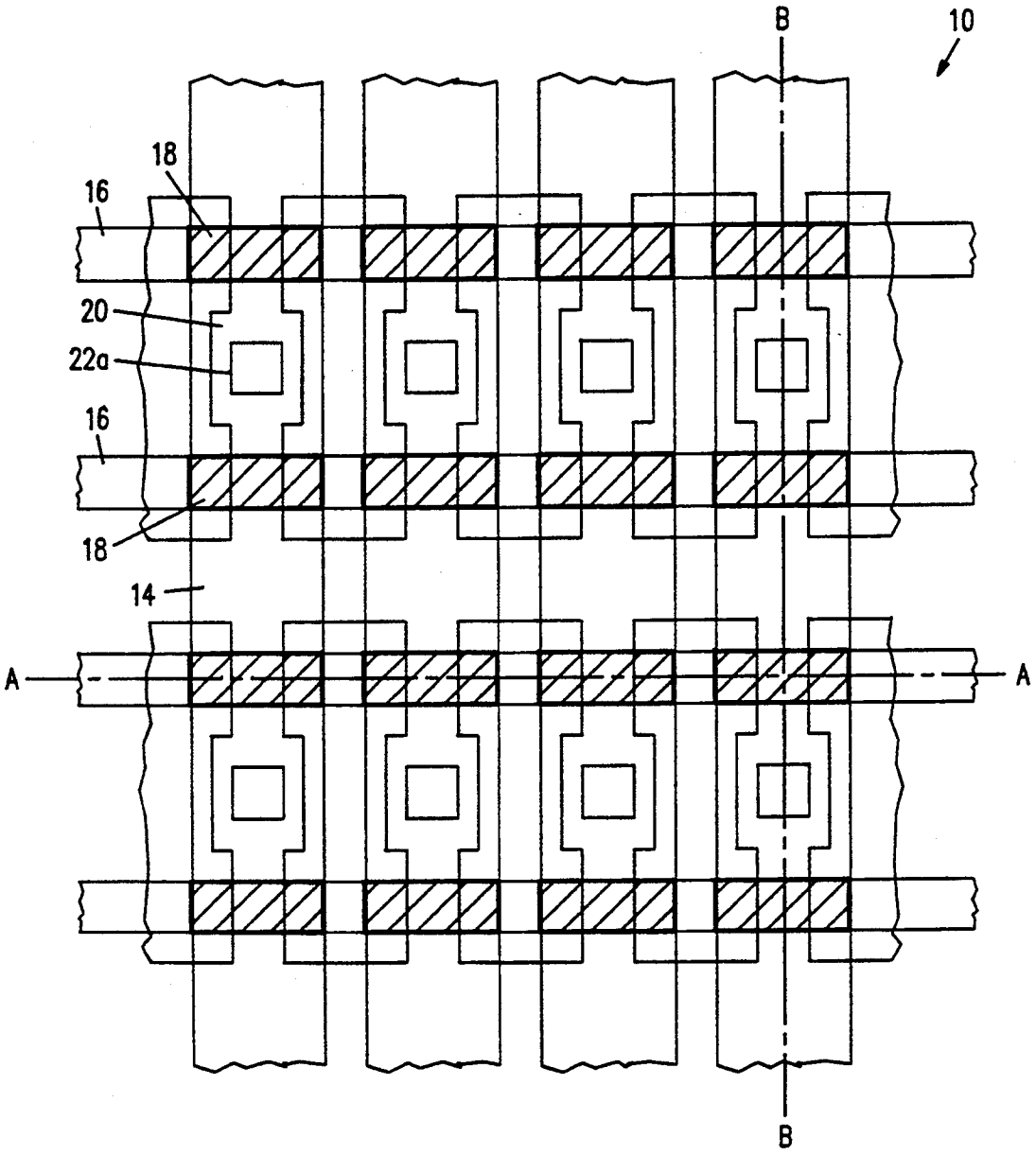
*Primary Examiner*—Tom Thomas
*Attorney, Agent, or Firm*—Limbach & Limbach

[57] **ABSTRACT**

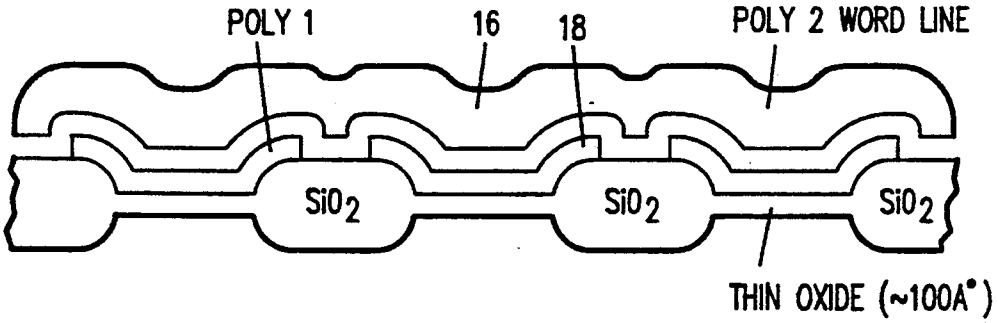
A method of forming a contactless EPROM cell inlcudes an initial step of forming an N+ source line in a silicon substrate. First and second N+ drain lines are then formed in parallel with and spaced-apart from the source line on opposite sides of the source line. First and second field oxide strips are formed in parallel with, but spaced-apart from the first and second drain lines, respectively, such that the source line/drain line structure is bounded on both sides by the first and second field oxide strips to separate the structure from adjacent source/drain line structures. First and second poly 1 lines overly the channel regions between the first drain line and the source line and the second drain line and the source line respectively, and are separated therefrom by a first layer of dielectric material. A plurality of spaced-apart, parallel poly 2 word lines overly and run perpendicular to the first and second poly 1 lines and are spaced-apart therefrom by a second dielectric material. Thus, the method results in an EPROM array having cells that are defined at each crossing of the poly 1 lines and the poly 2 word lines.

**3 Claims, 6 Drawing Sheets**

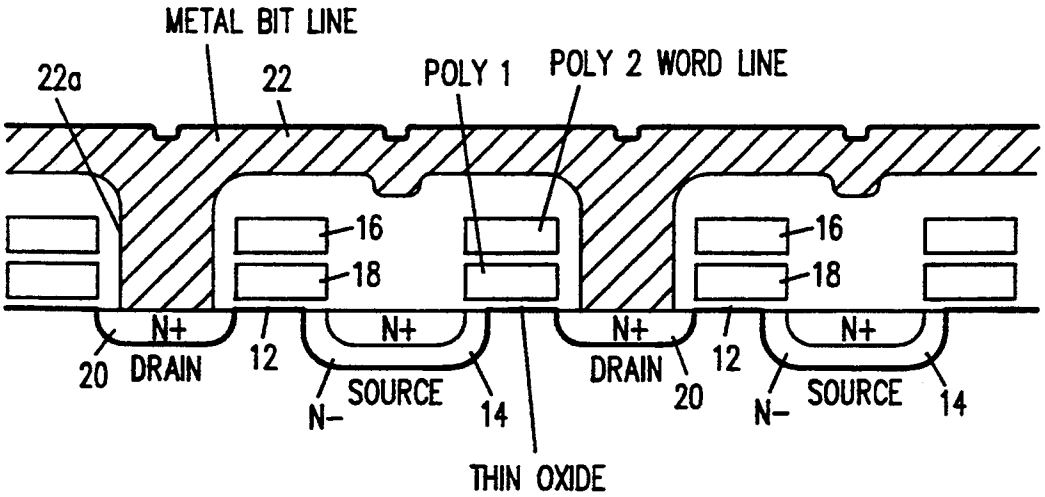




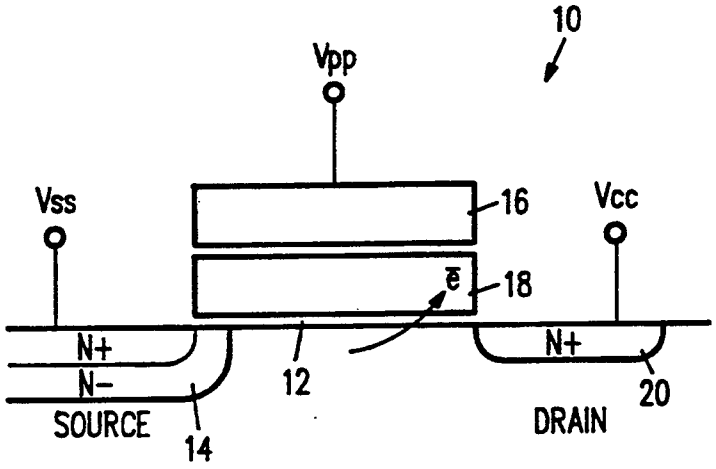

PRIOR ART
FIG. 1




PRIOR ART
FIG. 2

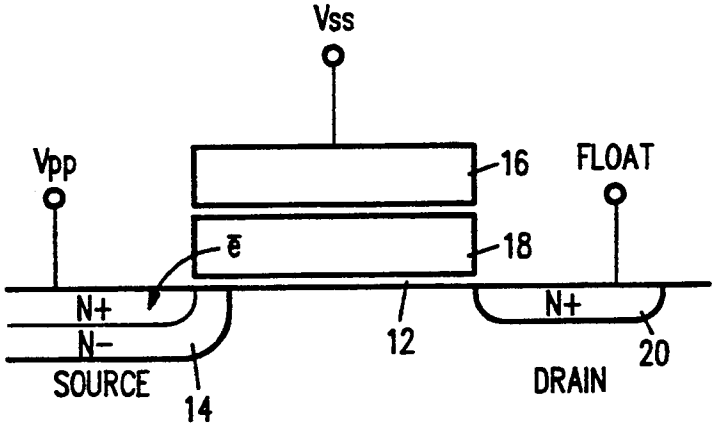



PRIOR ART
FIG. 3




PRIOR ART

FIG. 4A




PRIOR ART

FIG. 4B

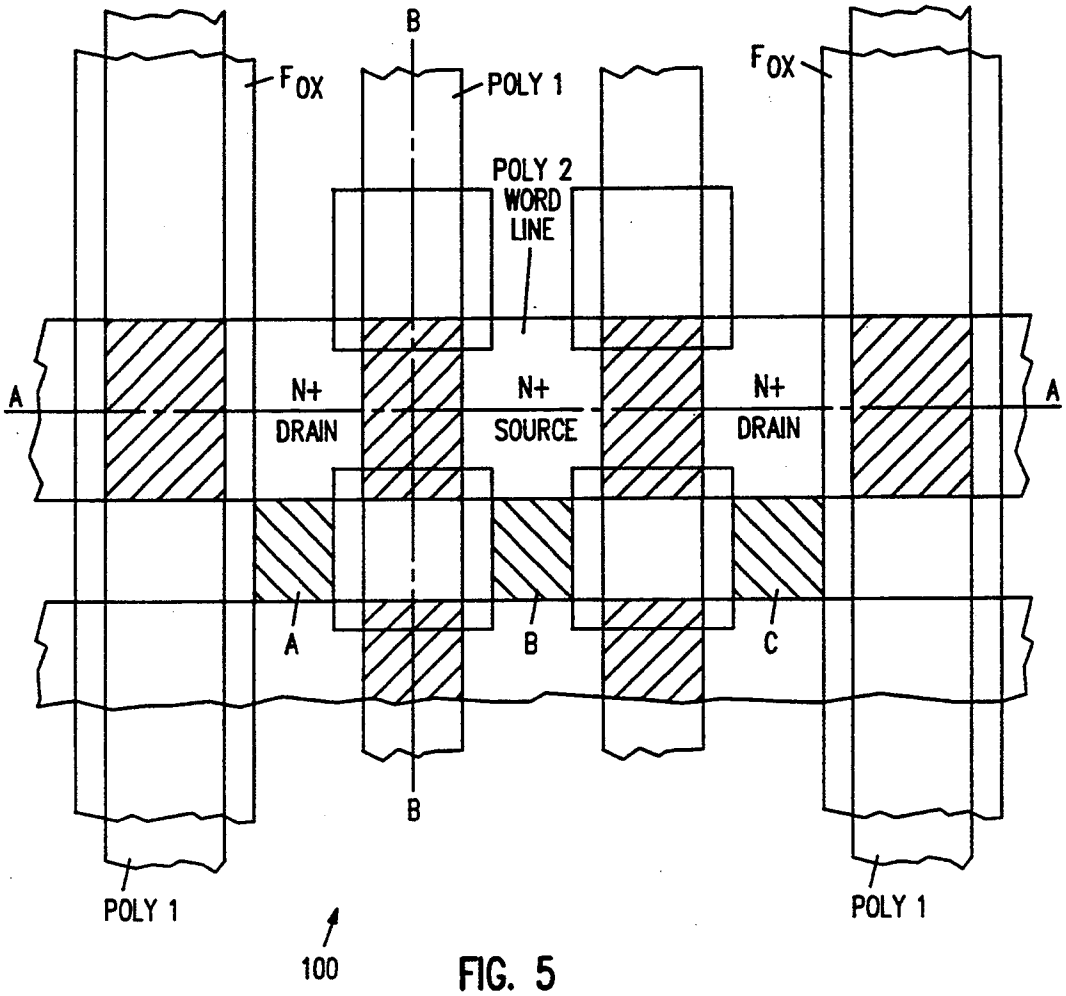



FIG. 5

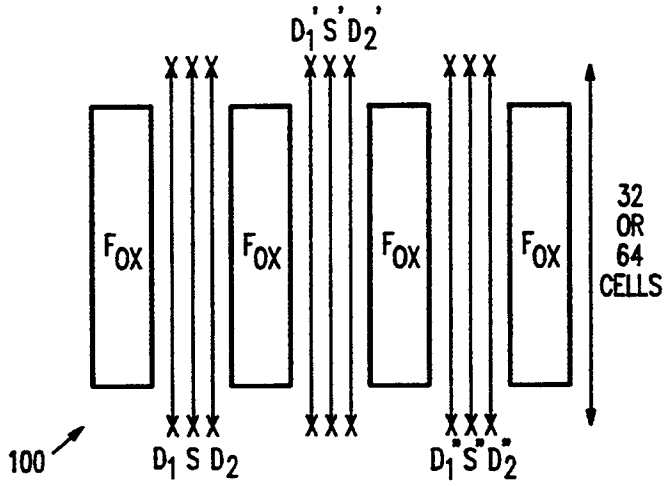



FIG. 6

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