



US005920790A

United States Patent [19]

[11] **Patent Number:** **5,920,790**

Wetzel et al.

[45] **Date of Patent:** **Jul. 6, 1999**

[54] **METHOD OF FORMING A SEMICONDUCTOR DEVICE HAVING DUAL INLAID STRUCTURE**

OTHER PUBLICATIONS

[75] Inventors: **Jeffrey T. Wetzel; John J. Stankus**, both of Austin, Tex.

B. Luther et al., "Planar Copper-Polyimide Back End of the Line Interconnections for ULSI Devices", Jun. 8-9, 1993 VMIC Conference, Catalog No. 93ISMIC-102, pp. 15-21.

[73] Assignee: **Motorola, Inc.**, Schaumburg, Ill.

Primary Examiner—John F. Niebling
Assistant Examiner—David A. Zarneke

[21] Appl. No.: **08/921,293**

[57] ABSTRACT

[22] Filed: **Aug. 29, 1997**

A method for forming semiconductor device (1) that includes providing a substrate (10) having a metal interconnect (12), depositing a via interlevel dielectric (ILD) layer (20) over the substrate (10) and the metal interconnect (12), etching the via ILD layer (20) to form a via (30) over the metal interconnect (12), depositing a trench ILD layer (32) over the via ILD layer (20) and the via (30), etching the trench ILD layer (32) to form a trench (40), the trench (40) being contiguous with the via (12), and depositing a metal (44) so as to fill the via (30) and the trench (40), and provide electrical connection with the metal interconnect (12).

[51] **Int. Cl.⁶** **H01L 21/4763**

[52] **U.S. Cl.** **438/618; 438/622; 438/623; 438/624; 438/627; 438/628; 438/634; 438/638**

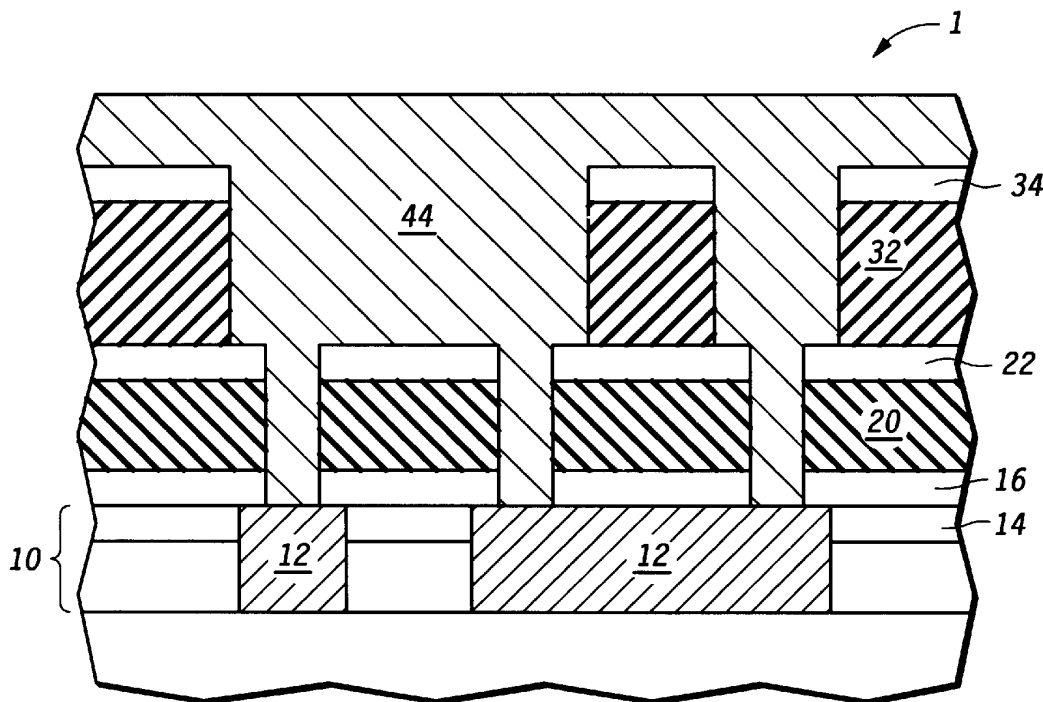
[58] **Field of Search** **438/618, 622, 438/623, 624, 627, 628, 634, 638**

[56] References Cited

U.S. PATENT DOCUMENTS

4,702,792	10/1987	Chow et al.	156/628
4,789,648	12/1988	Chow et al.	437/225
4,944,836	7/1990	Beyer et al.	156/645

26 Claims, 4 Drawing Sheets



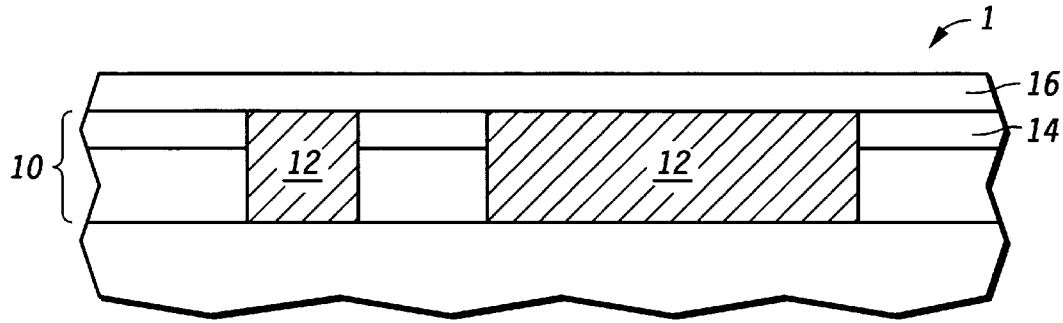


FIG. 1

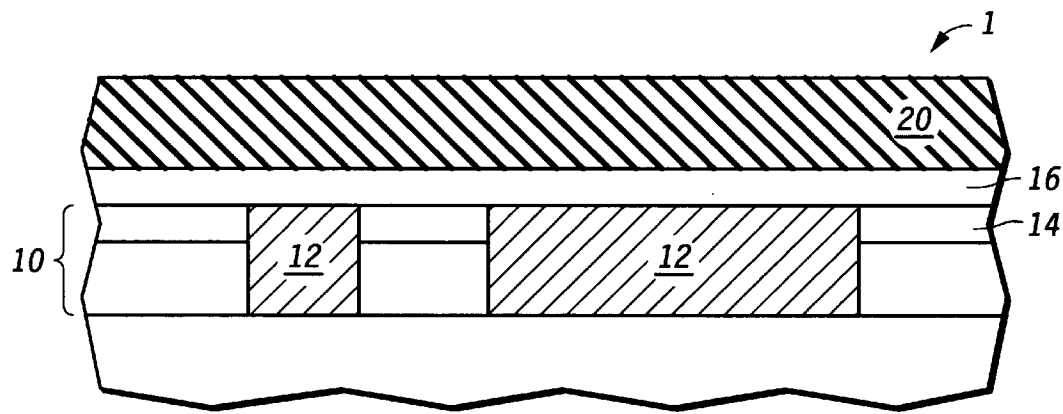


FIG. 2

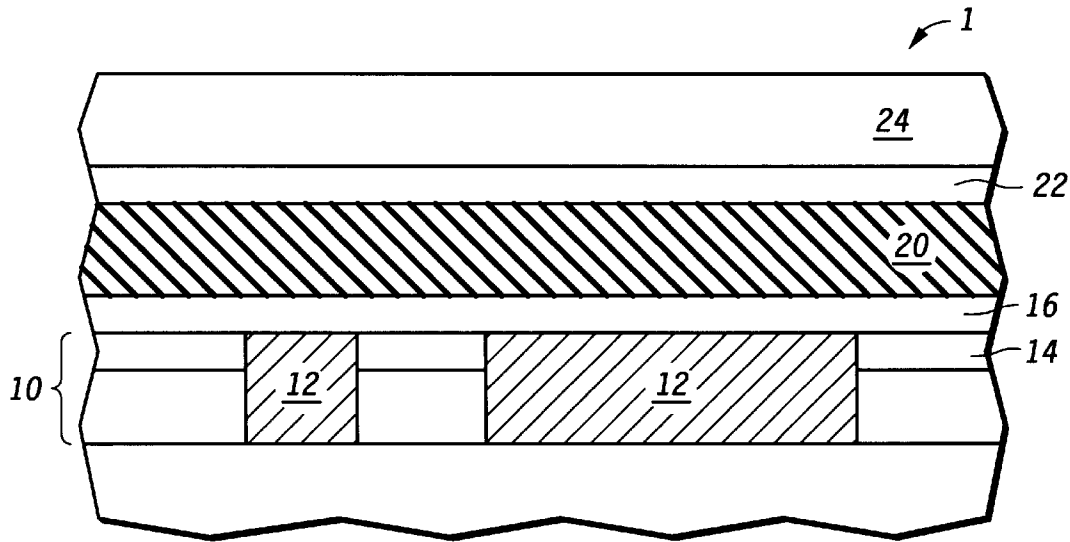


FIG. 3

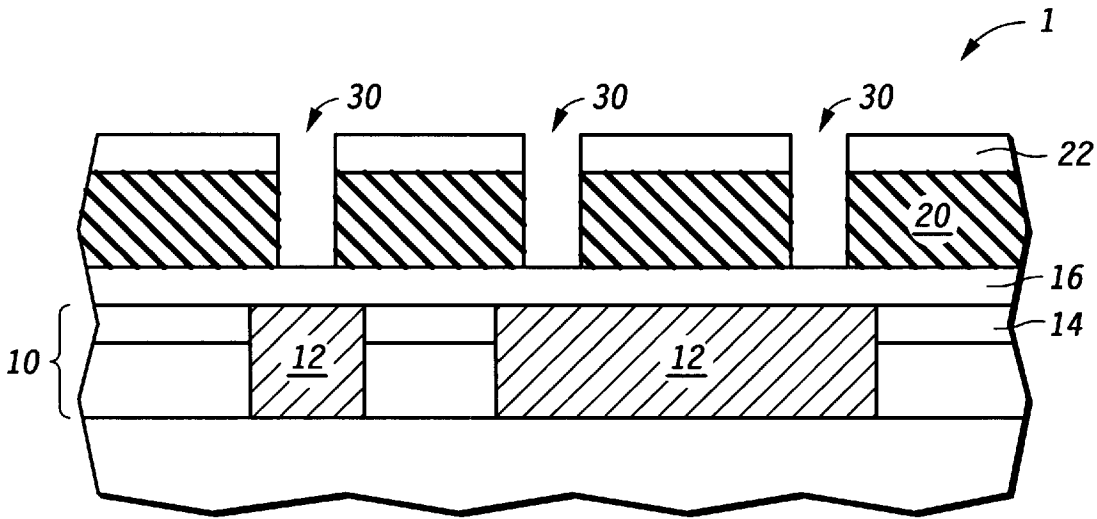


FIG. 4

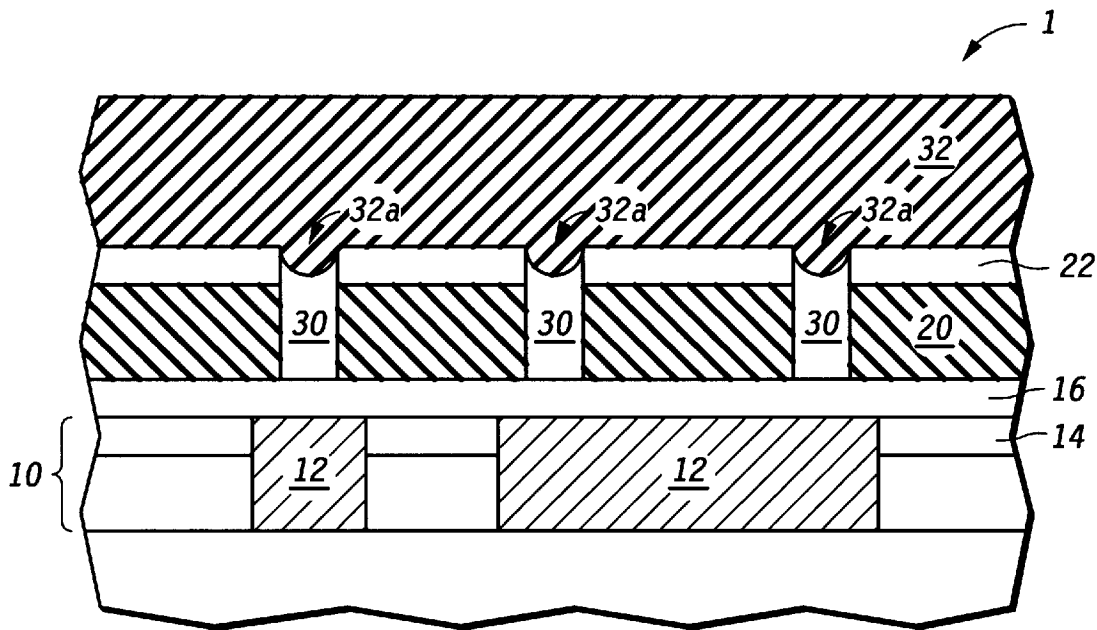


FIG. 5

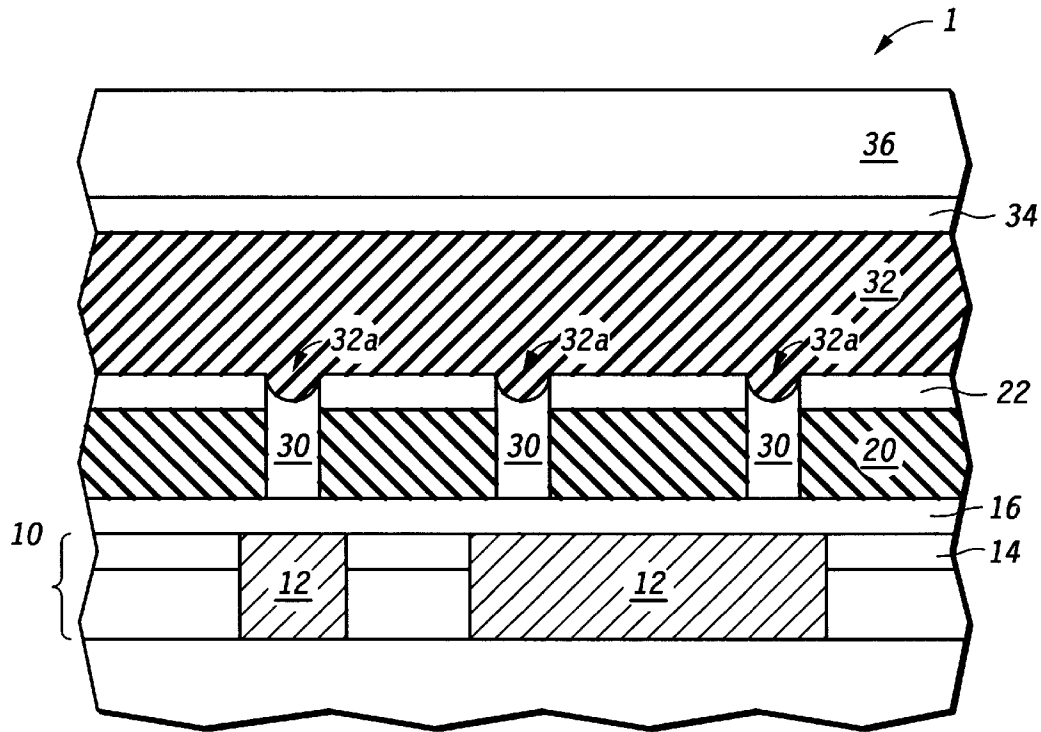


FIG. 6

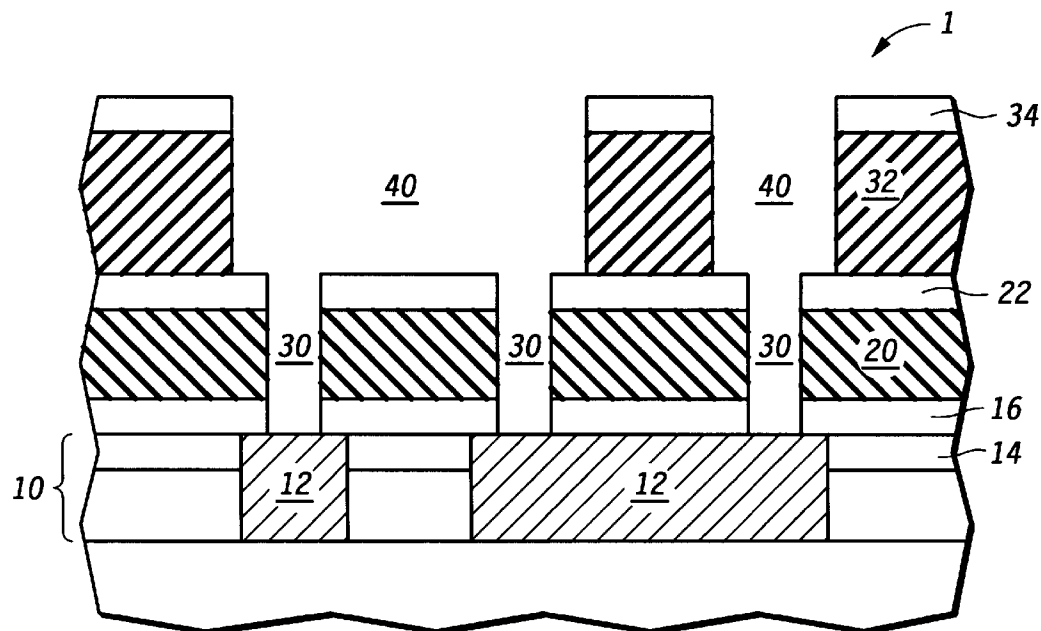


FIG. 7

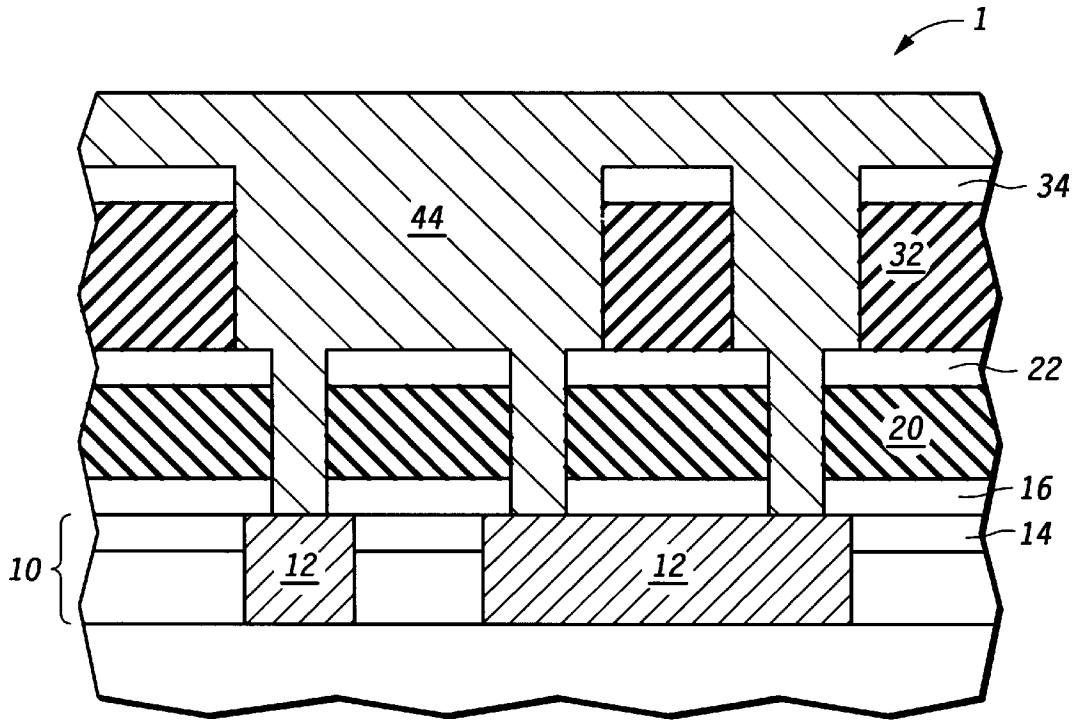


FIG. 8

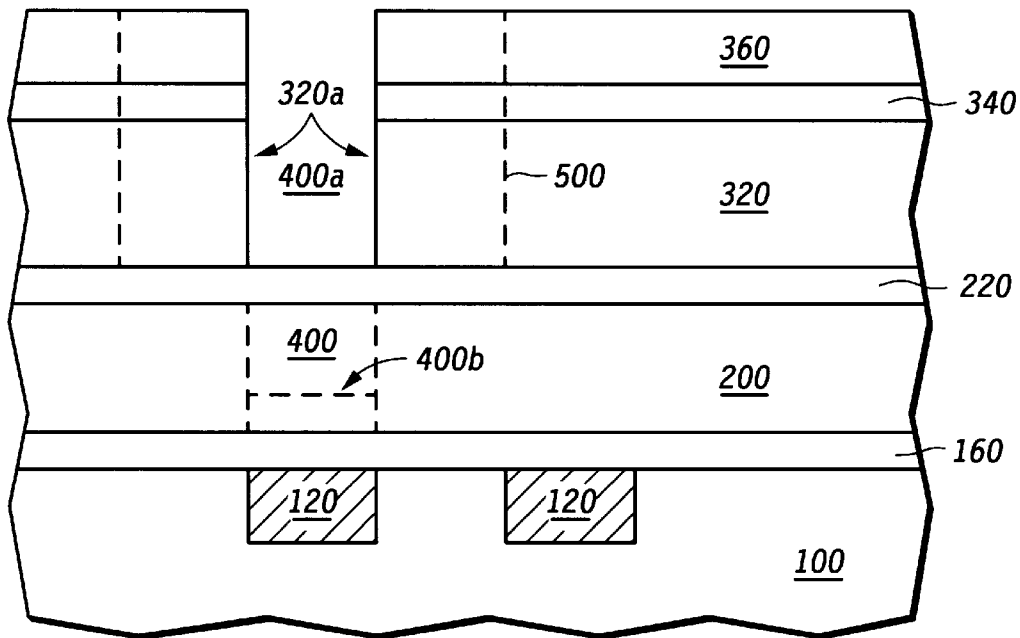


FIG. 9
-PRIOR ART-

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.