

[54] PROCESS OF FABRICATING THREE-DIMENSIONAL SEMICONDUCTOR DEVICE

[75] Inventors: Masaaki Yasumoto; Hiroshi Hayama; Tadayoshi Enomoto, all of Tokyo, Japan

[73] Assignee: NEC Corporation, Tokyo, Japan

[21] Appl. No.: 755,987

[22] Filed: Jul. 17, 1985

[30] Foreign Application Priority Data

Jul. 20, 1984 [JP] Japan 59-150598

[51] Int. Cl.⁴ B44C 1/22; B29C 17/08; C09J 5/02; C23F 1/02

[52] U.S. Cl. 156/633; 29/576 J; 29/591; 148/1.5; 156/634; 156/643; 156/653; 156/656; 156/657; 156/659.1; 156/668; 156/307.3; 357/71; 427/89; 430/313; 430/314; 430/317; 430/318

[58] Field of Search 156/633, 634, 643, 644, 156/646, 653, 656, 657, 659.1, 668, 307.3, 313; 430/313, 314, 315, 317, 318; 427/38, 39, 88-91; 357/65, 71; 29/571, 576 R, 576 W, 576 J, 578, 588, 591; 148/1.5, 187

[56] References Cited

U.S. PATENT DOCUMENTS

4,400,868 8/1983 Antypas et al. 29/576 J
4,552,607 11/1985 Frey 156/307.3

Primary Examiner—William A. Powell
Attorney, Agent, or Firm—Sughrue, Mion, Zinn, Macpeak, and Seas

[57] ABSTRACT

A process of fabricating a three-dimensional semiconductor device, comprising the steps of preparing at least two multilayer structures each including at least one semiconductor element and a conductor connected at one end to the semiconductor element and having at the other end an exposed surface, at least one of the multilayer structures further including a thermally fusible insulating adhesive layer having a surface coplanar with the exposed surface of the conductor, positioning the multilayer structures so that the exposed surfaces of the respective conductors of the multilayer structures are spaced apart from and aligned with each other, moving at least one of the multilayer structures with respect to the other until the exposed surfaces of the conductors of the multilayer structures contact each other, and heating the multilayer structures for causing the insulating adhesive layer of at least one of the multilayer structures to thermally fuse to the other multilayer structure with the semiconductor elements electrically connected together.

15 Claims, 8 Drawing Figures

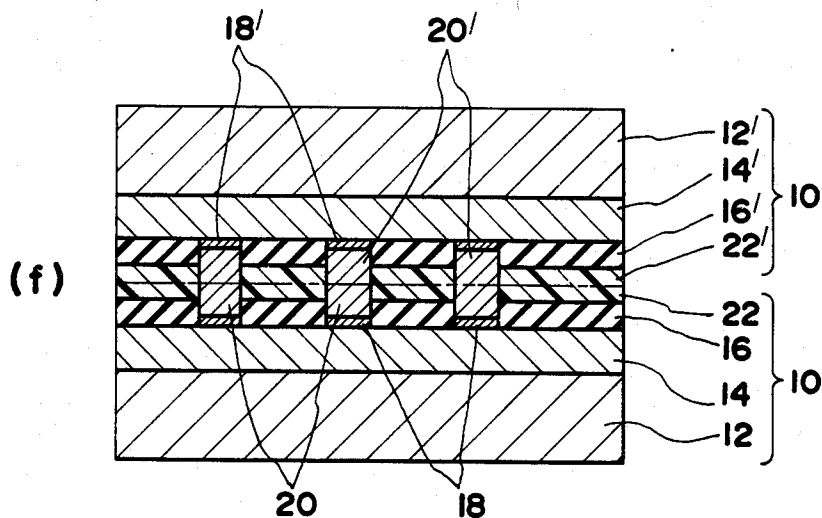


FIG. 1

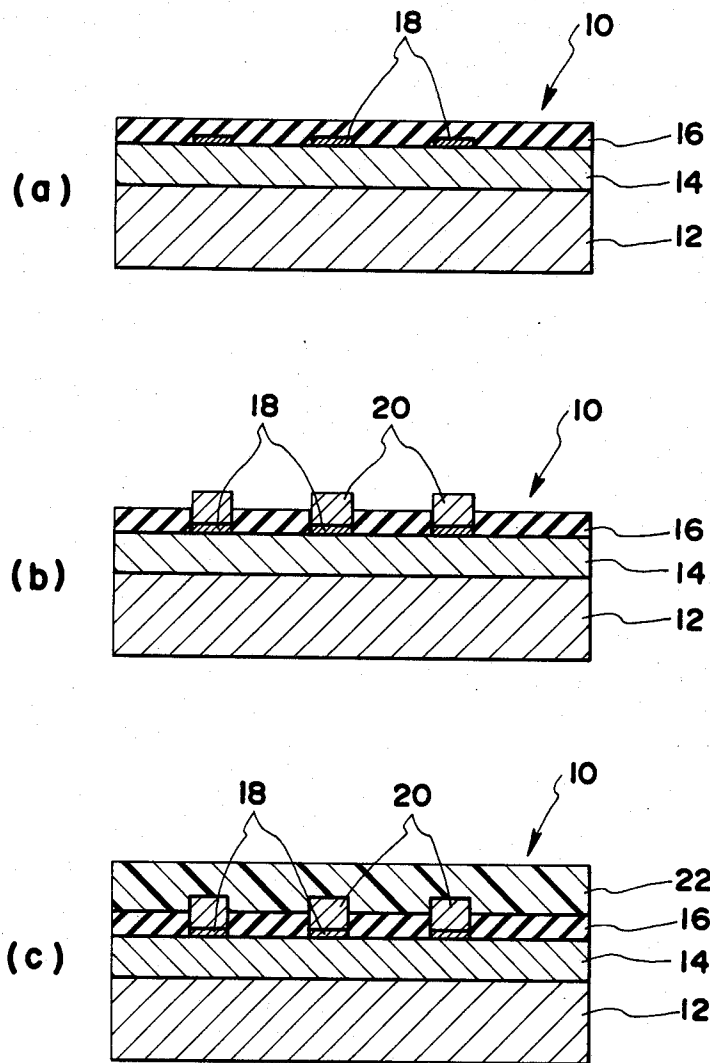


FIG. 1

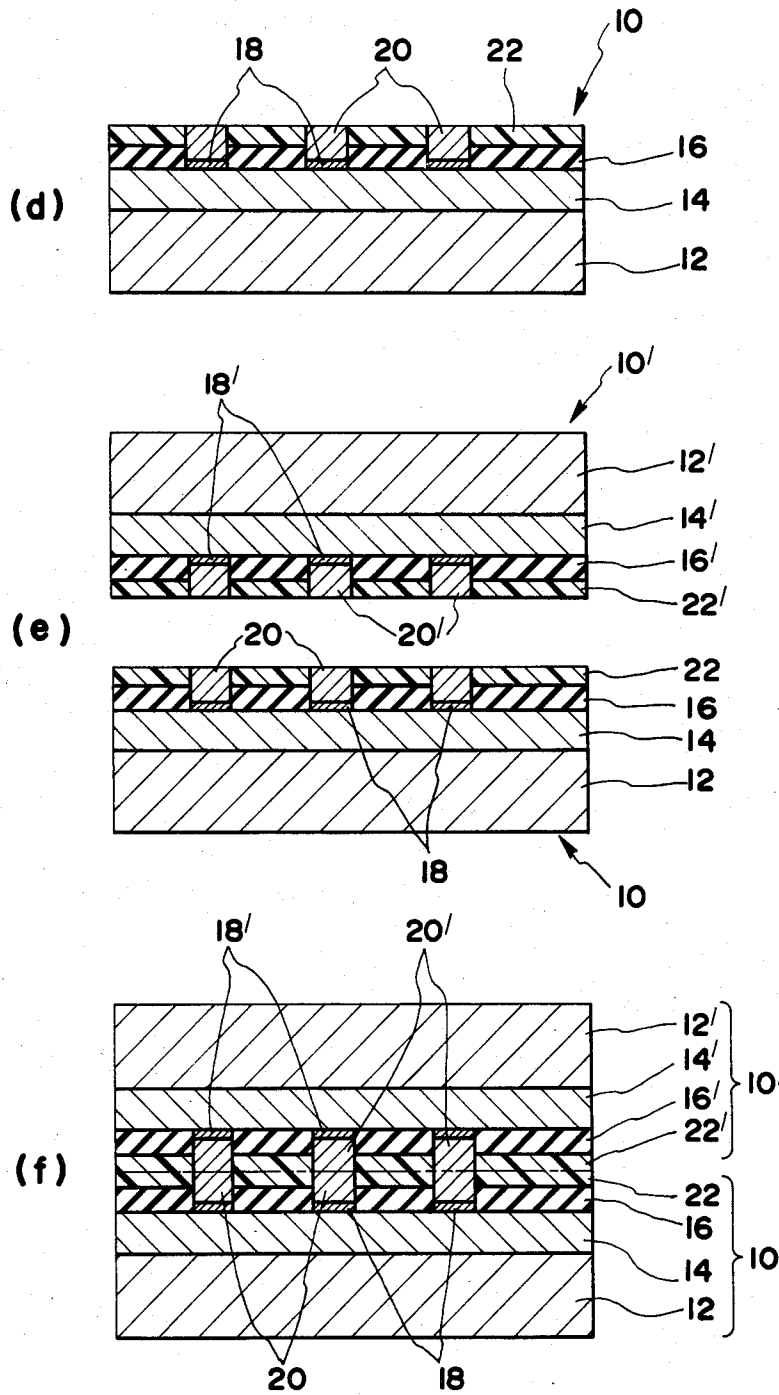


FIG. 2

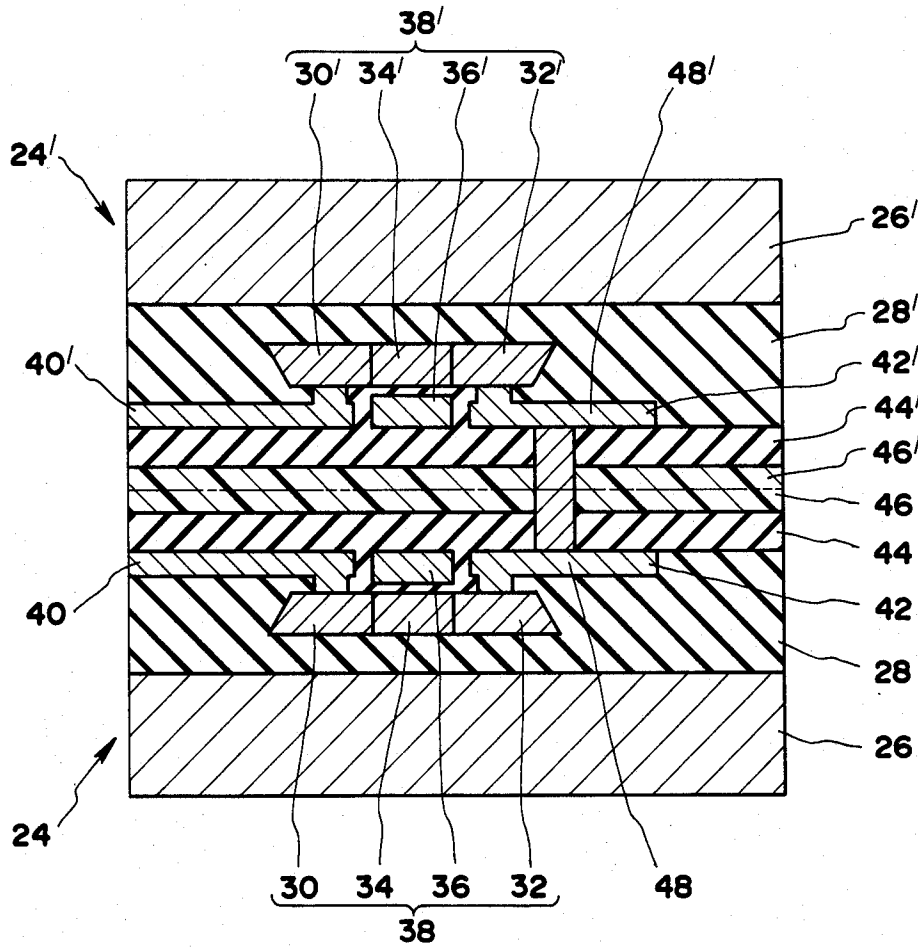
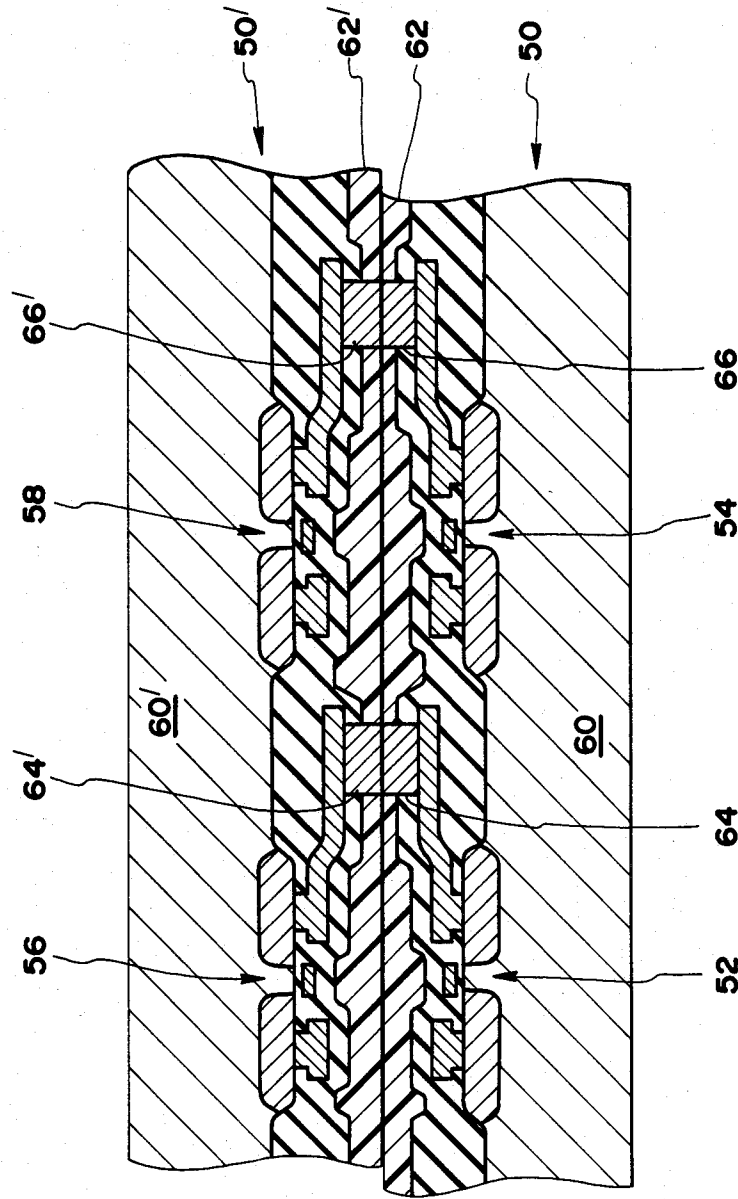


FIG. 3



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.