

# United States Patent [19]

**Bhattacharyya et al.**

[11] **Patent Number:** 4,776,922

[45] **Date of Patent:** Oct. 11, 1988

[54] **FORMATION OF VARIABLE-WIDTH  
SIDEWALL STRUCTURES**

[75] **Inventors:** Arup Bhattacharyya, Essex Junction;  
Michael L. Kerbaugh, Burlington;  
Robert M. Quinn, South Burlington;  
Jeffrey A. Robinson, Essex Junction,  
all of Vt.

[73] **Assignee:** International Business Machines  
Corporation, Armonk, N.Y.

[21] **Appl. No.:** 114,959

[22] **Filed:** Oct. 30, 1987

[51] **Int. Cl.<sup>4</sup>** ..... B44C 1/22; C03C 15/00;  
C23F 1/02; B29C 37/00

[52] **U.S. Cl.** ..... 156/643; 156/646;  
156/648; 156/653; 156/656; 156/657;  
156/659.1; 156/668; 204/192.37; 437/228;  
437/235; 437/245

[58] **Field of Search** ..... 156/643, 646, 648, 652,  
156/653, 656, 657, 659.1, 668; 430/313, 314,  
317, 318; 204/192.32, 192.35, 192.36, 192.37;  
437/40, 41, 56-59, 61, 63, 80, 203, 228, 235, 245

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

4,424,621 1/1984 Abbas et al. .... 156/657 X  
4,502,914 3/1985 Trumpp et al. .... 156/655 X  
4,577,391 3/1986 Hsia et al. .... 437/56 X  
4,648,937 3/1987 Ogura et al. .... 156/643

*Primary Examiner*—William A. Powell  
*Attorney, Agent, or Firm*—Mark F. Chadurjian

[57] **ABSTRACT**

Spacers are formed having widths that vary as a function of the spacing between the mandrels upon which the conformal material that defines the spacers is deposited and etched. As the spacing between adjacent mandrels decreases, the width of the resulting spacers decreases. The correlation between mandrel spacing and sidewall structure width is independent of the thickness of the conformal material as-deposited. As the spacing between the mandrels decreases, the decrease in width becomes more pronounced, particularly at mandrel spacings of five microns or less. Thus, by making adjacent mandrels closer together or further apart and adjusting mandrel height, active/passive components having differing widths/lengths may be formed from the same conformal layer.

**6 Claims, 5 Drawing Sheets**

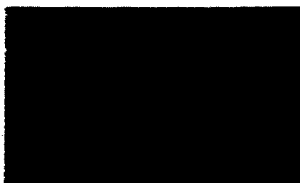


FIG.1

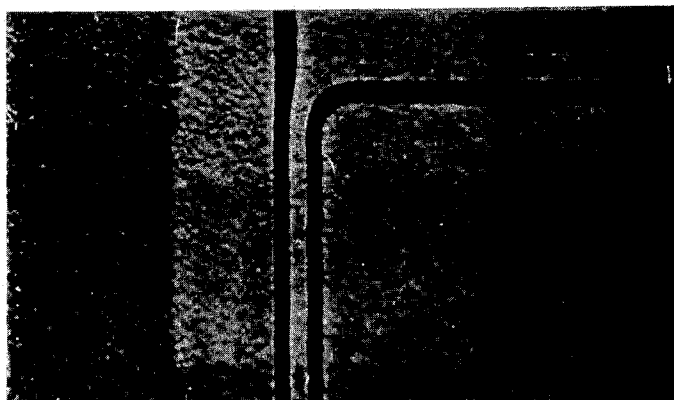


FIG.2

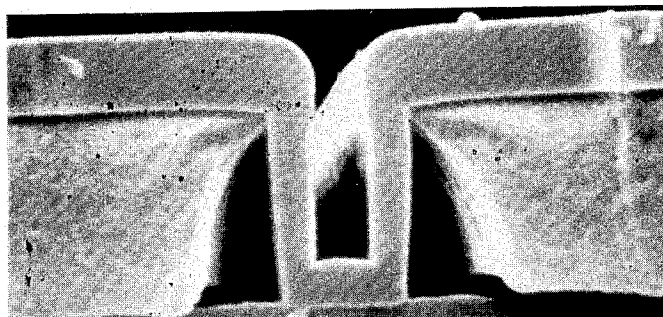


FIG.3

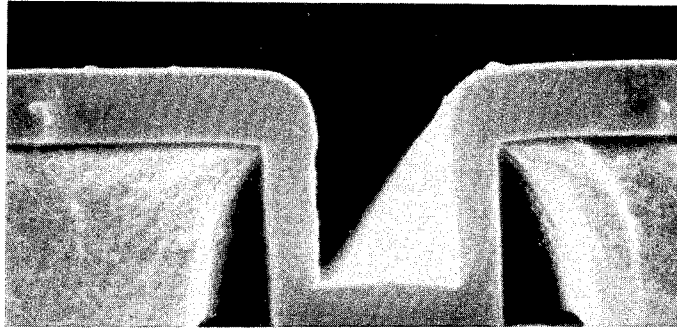


FIG.4

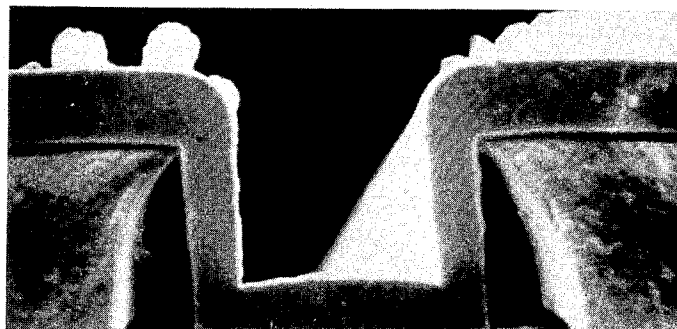
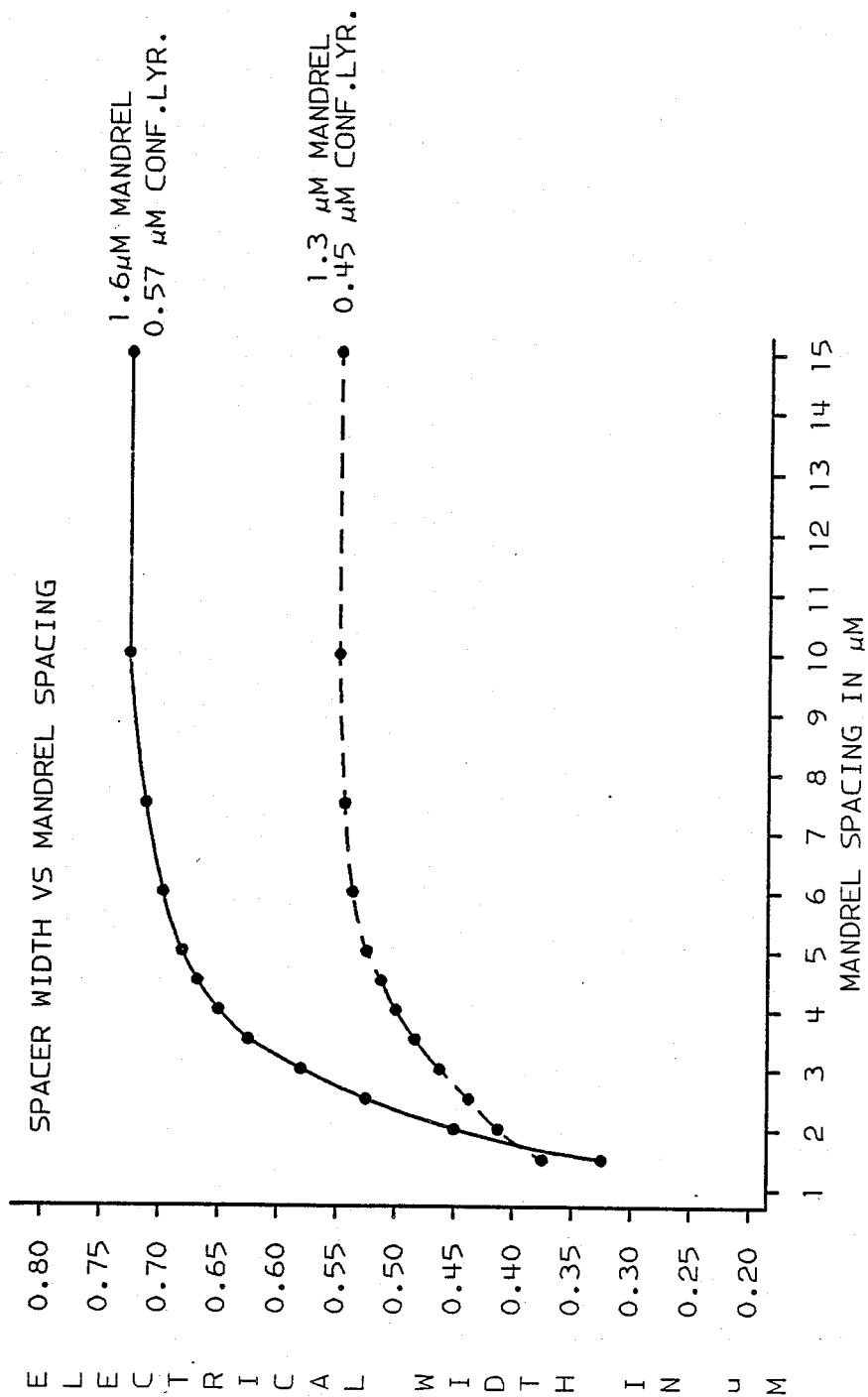
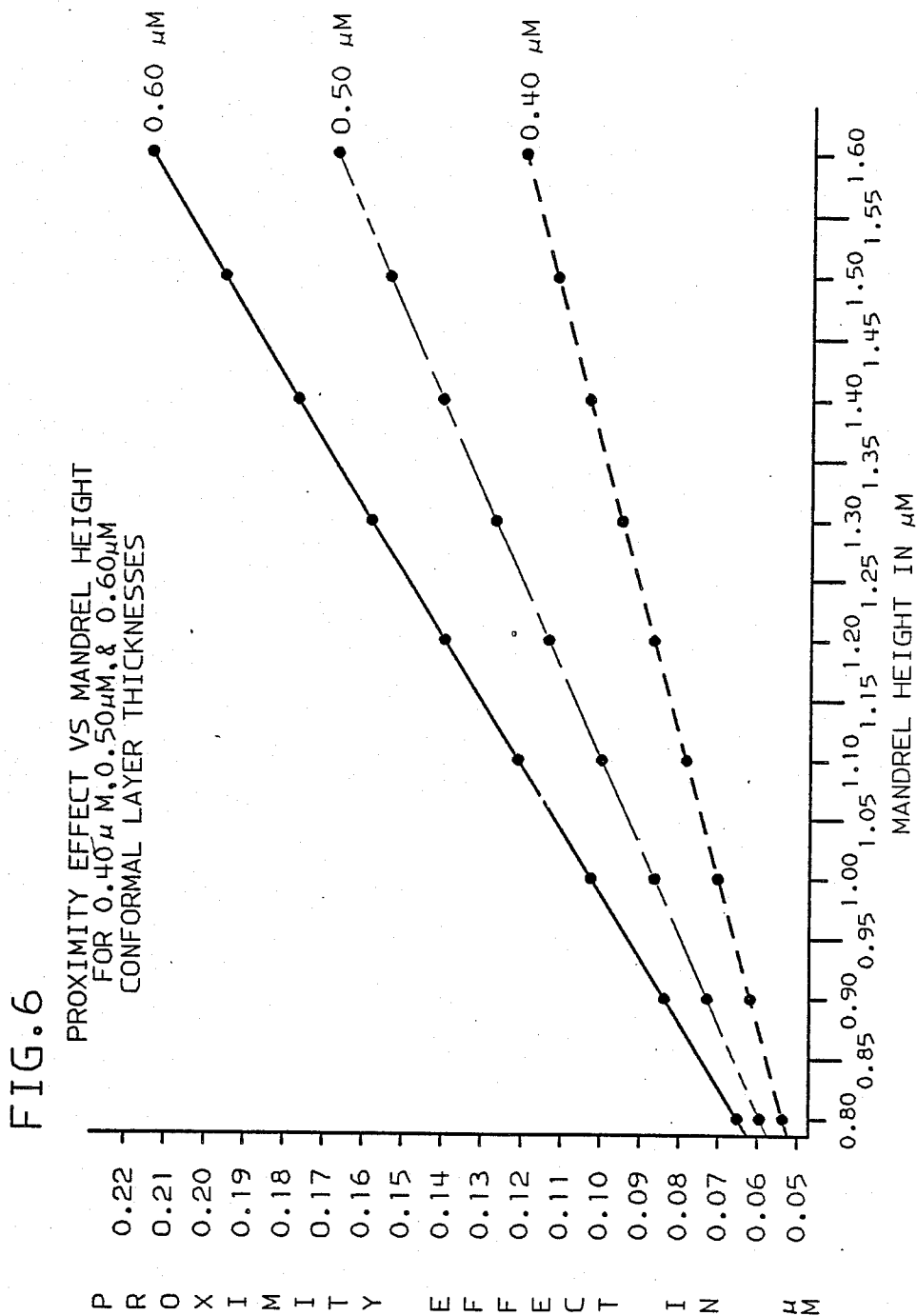


FIG. 5





# 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.