EXHIBIT 14

US006746973B1

(12) **United States Patent** (10) Patent No.: **US 6,746,973 B1**

Labelle et al. (45) **Date of Patent:** **Jun. 8, 2004**

(54) **EFFECT OF SUBSTRATE SURFACE TREATMENT ON 193 NM RESIST PROCESSING**

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

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(51) Int. Cl.[7] **H01L 21/302**; H01L 21/461

(52) U.S. Cl. **438/948**; 438/694; 438/724; 438/725

(58) Field of Search 438/778, 779, 438/780, 781, 798, 948, 949, 724, 725, 744, 894, 723; 430/311, 313, 314, 317

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,103,457 A   8/2000 Gabriel 430/318
2001/0045646 A1 * 11/2001 Shields et al. 257/734

2003/0045008 A1 *   3/2003 Olsen et al. 438/7

FOREIGN PATENT DOCUMENTS

JP   10186672   * 7/1998

* cited by examiner

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(57) **ABSTRACT**

One aspect of the present invention relates to a system and method for mitigating surface abnormalities on a semiconductor structure. The method involves exposing the layer to a first plasma treatment in order to mitigate surface interactions between the layer and a subsequently formed photoresist without substantially etching the layer, the first plasma comprising oxygen and nitrogen; forming a patterned photoresist over the treated layer, the patterned photoresist being formed using 193 nm or lower radiation; and etching the treated layer through openings of the patterned photoresist. The system and method also includes a monitor processor for determining whether the plasma treatment has been administered and for adjusting the plasma treatment components. The monitor processor transmits a pulse, receives a reflected pulse response and analyzes the response. An optional second plasma treatment comprising nitrogen and hydrogen may be administered after the first plasma treatment but before forming the photoresist.

29 Claims, 6 Drawing Sheets
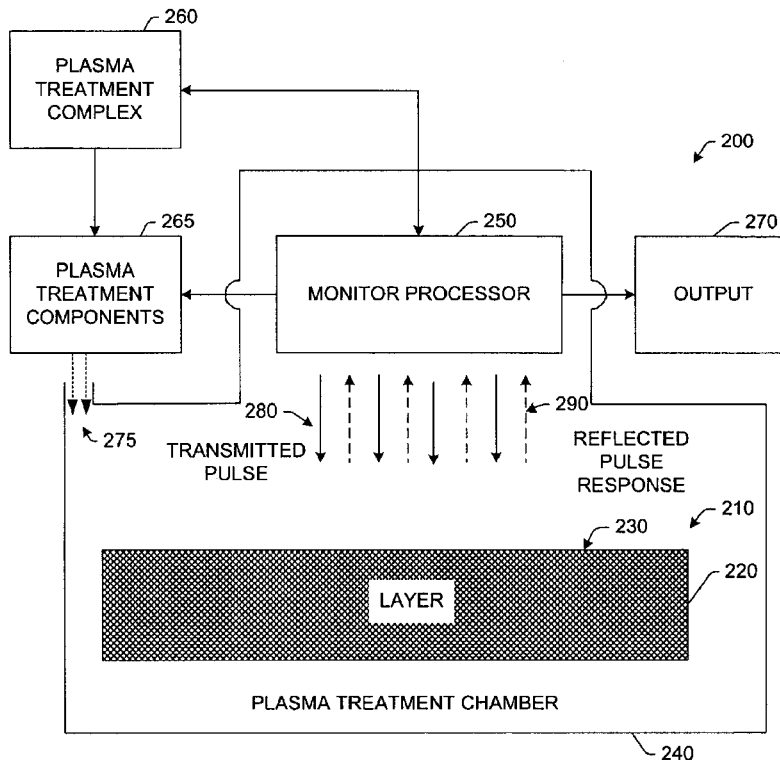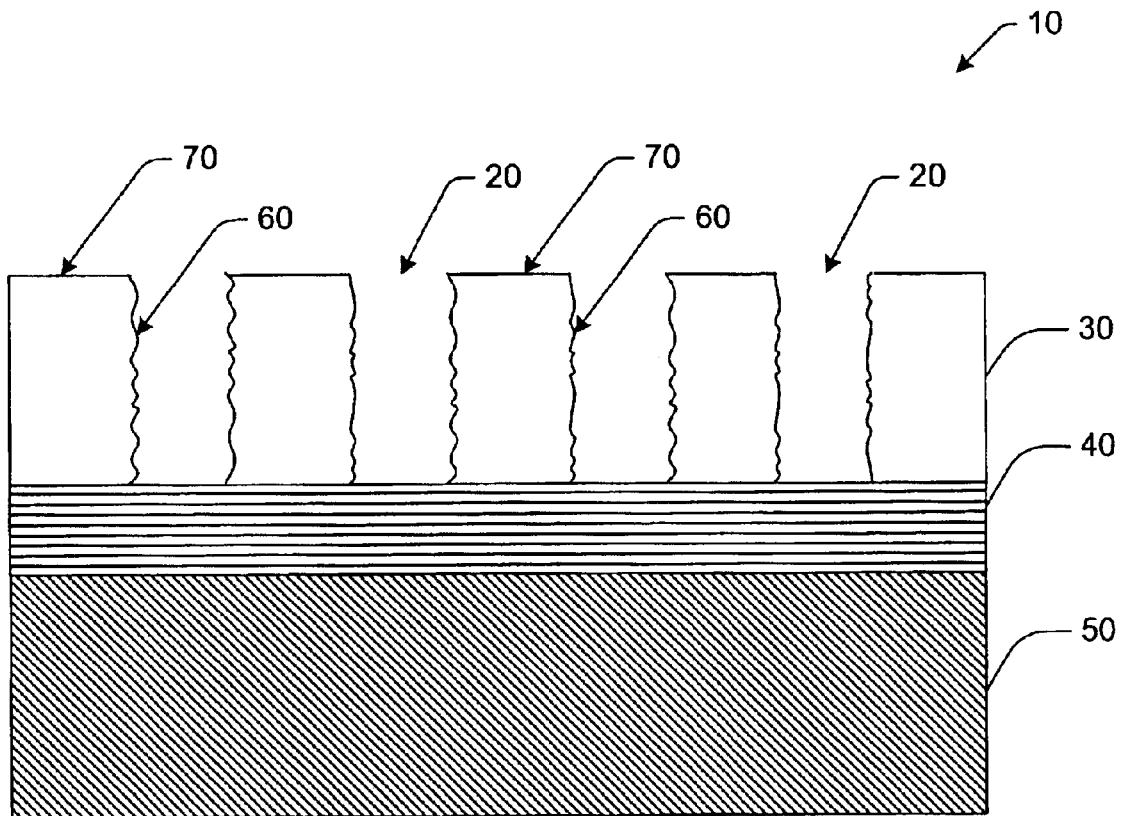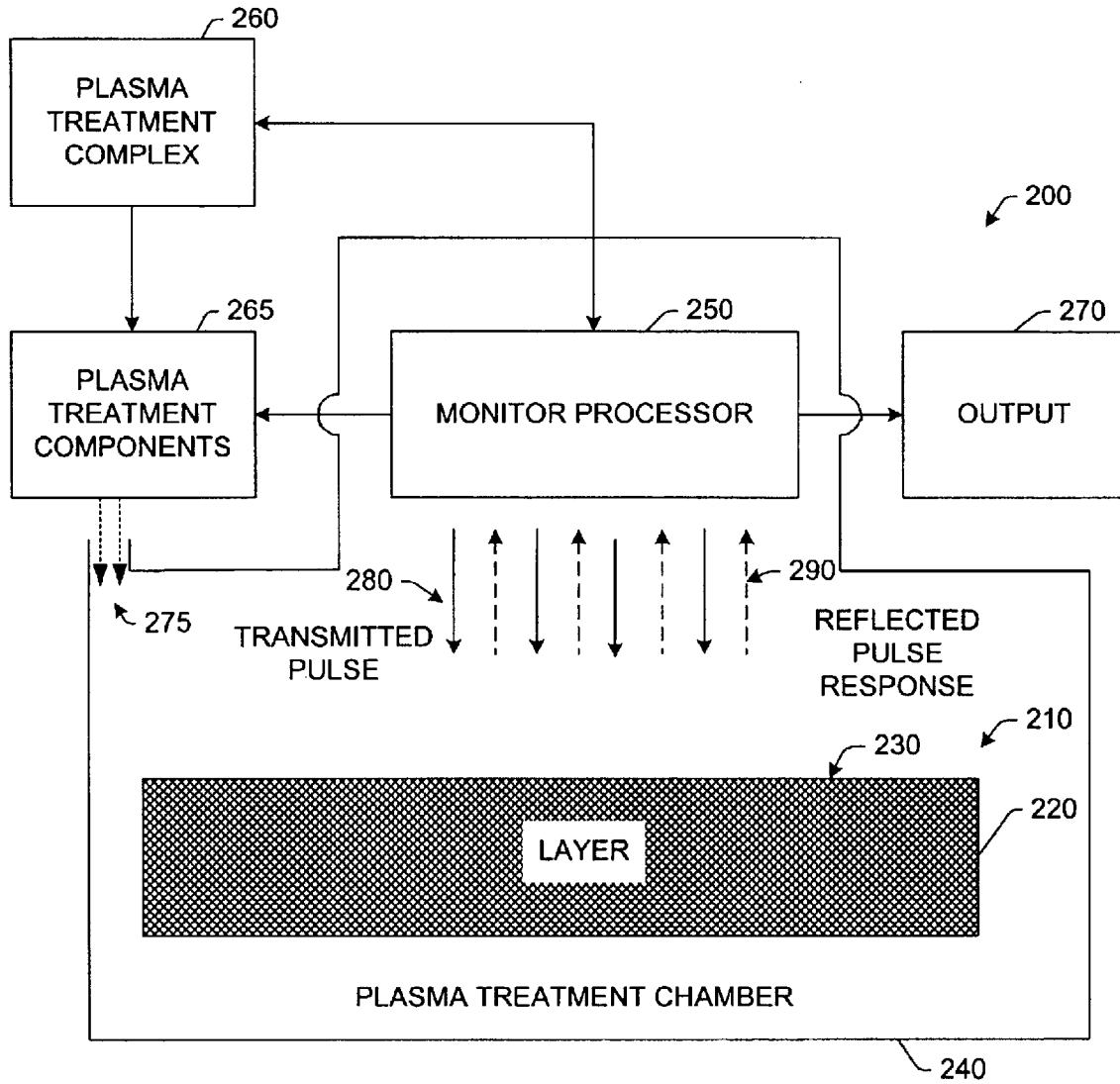
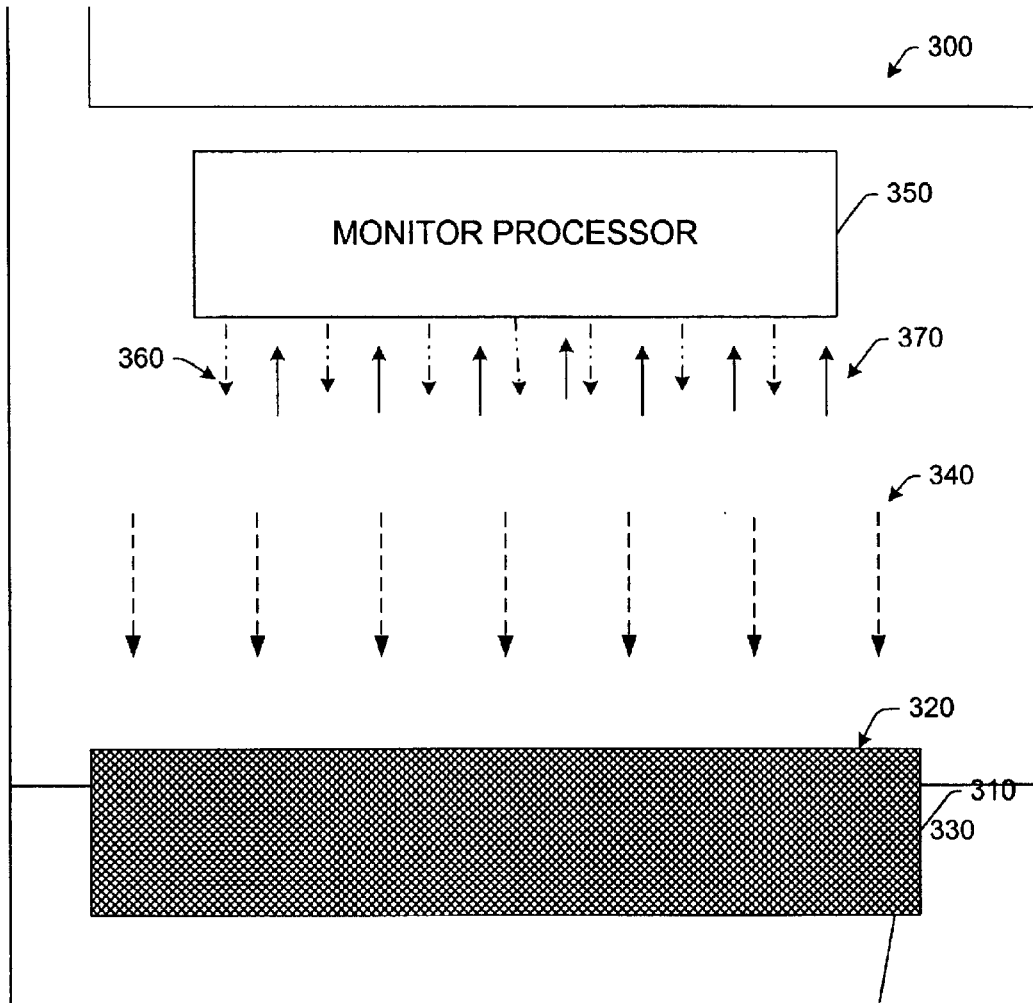**FIG. 1**
PRIOR ART

FIG. 2

FIG. 3

DOCKET ALARM

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