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Flamm

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- (54) **MULTI-TEMPERATURE PROCESSING**
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Related U.S. Patent Documents

- Reissue of:
- (64) Patent No.: **6,231,776**
 - Issued: **May 15, 2001**
 - Appl. No.: **09/151,163**
 - Filed: **Sep. 10, 1998**

- U.S. Applications:
- (63) Continuation-in-part of application No. 08/567,224, filed on Dec. 4, 1995, now abandoned.
 - (60) Provisional application No. 60/058,650, filed on Sep. 11, 1997.

- (51) **Int. Cl.**
H05H 1/00 (2006.01)
H01L 21/302 (2006.01)

- (52) **U.S. Cl.** **216/59**; 216/67; 216/68; 216/74; 438/714; 438/715; 204/192.32; 156/345.52; 156/345.53
- (58) **Field of Classification Search** 438/715, 438/719, 721, 725, 737, 738; 216/41, 49, 216/63-67, 75, 79; 156/345.27, 345.52, 345.53
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,179,264 A	1/1993	Cuomo et al.	219/121.43
5,294,778 A	3/1994	Carman et al.	219/385
5,320,982 A *	6/1994	Tsubone et al.	428/714
5,556,204 A *	9/1996	Tamura et al.	374/161
5,571,366 A	11/1996	Ishii	156/345
5,609,720 A *	3/1997	Lenz et al.	438/715
5,645,683 A	7/1997	Miyamoto	156/643.1
5,667,631 A	9/1997	Holland et al.	216/13
5,695,564 A	12/1997	Imahashi	118/719

5,700,734 A	12/1997	Ooishi	438/592
5,705,433 A *	1/1998	Olson et al.	438/695
5,756,401 A	5/1998	Iizuka	438/719
5,770,099 A	6/1998	Rice et al.	216/68
5,863,376 A	1/1999	Wicker et al.	156/345
5,925,212 A	7/1999	Rice et al.	156/345
5,939,831 A	8/1999	Fong et al.	315/111.21
5,948,283 A	9/1999	Grosshart	216/67
5,965,034 A *	10/1999	Vinogradov et al.	216/68
6,008,139 A	12/1999	Pan et al.	438/730
6,033,478 A	3/2000	Kholodenko	118/500
6,042,901 A	3/2000	Denison et al.	427/579
6,048,798 A	4/2000	Gadgil et al.	438/714
6,068,784 A	5/2000	Collins et al.	216/68
6,077,357 A *	6/2000	Rossman et al.	118/728
6,087,264 A *	7/2000	Shin et al.	438/706
6,090,303 A	7/2000	Collins et al.	216/68
6,140,612 A	10/2000	Husain et al.	219/390
6,165,311 A	12/2000	Collins et al.	156/345
6,167,834 B1	1/2001	Wang et al.	418/723
6,391,148 B2	5/2002	Marks et al.	
6,486,069 B1	11/2002	Marks et al.	
2001/0003676 A1	6/2001	Marks et al.	

FOREIGN PATENT DOCUMENTS

EP	1236226 A2	7/2001
JP	59076876 A *	5/1984
WO	WO-01/41189 A2	7/2001

* cited by examiner

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(57) **ABSTRACT**

The present invention provides a technique, including a method and apparatus, for etching a substrate in the manufacture of a device. The apparatus includes a chamber and a substrate holder disposed in the chamber. The substrate holder has a selected thermal mass to facilitate changing the temperature of the substrate to be etched during etching processes. That is, the selected thermal mass of the substrate holder allows for a change from a first temperature to a second temperature within a characteristic time period to process a film. The present technique can, for example, provide different processing temperatures during an etching process or the like.

59 Claims, 15 Drawing Sheets

Tokyo Electron Limited
EXHIBIT 1001
IPR Petition for

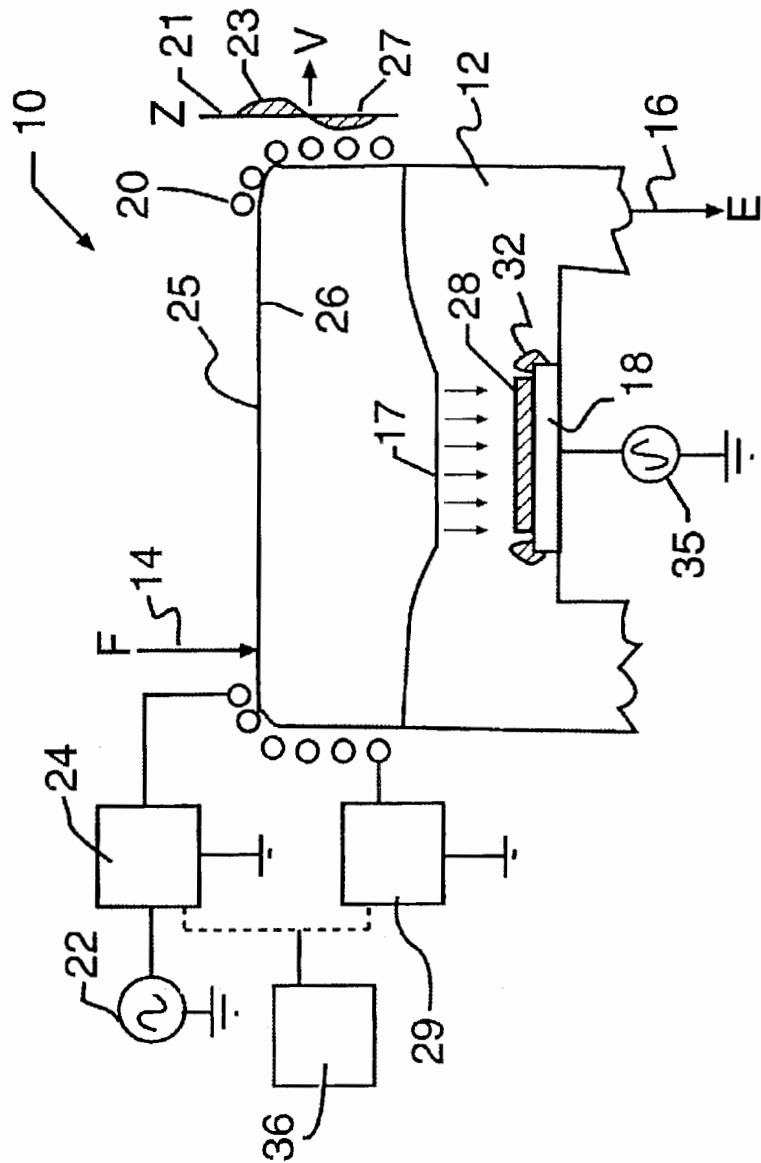


FIG. 1

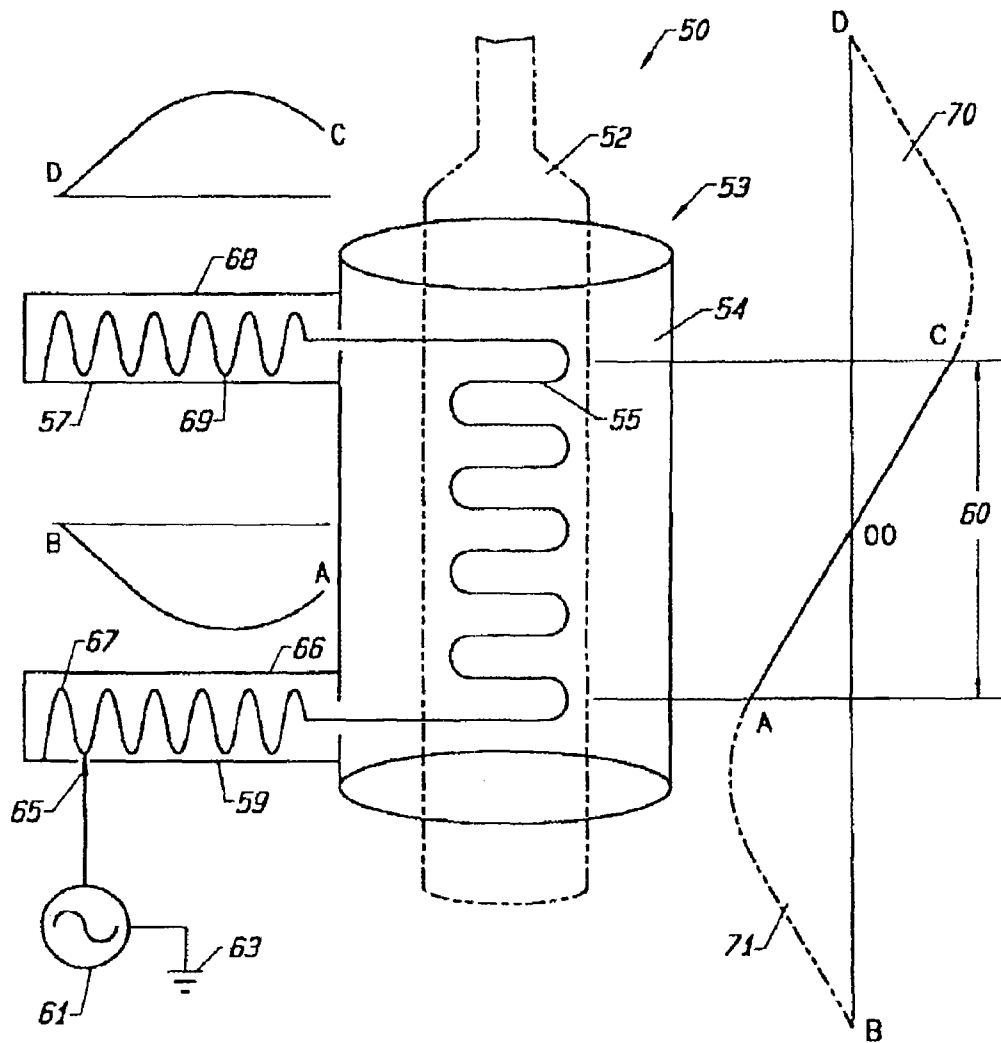


FIG. 2A

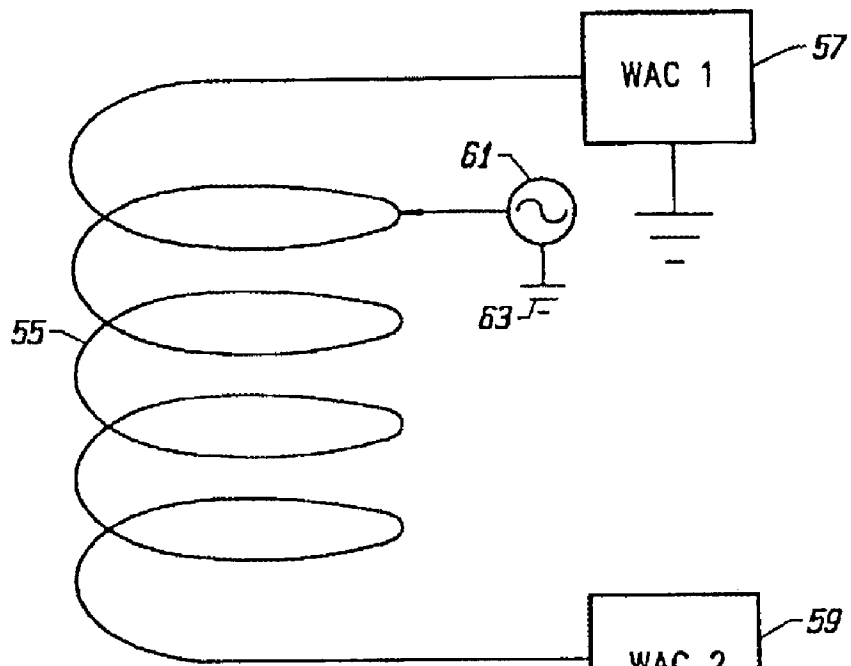


FIG. 2B

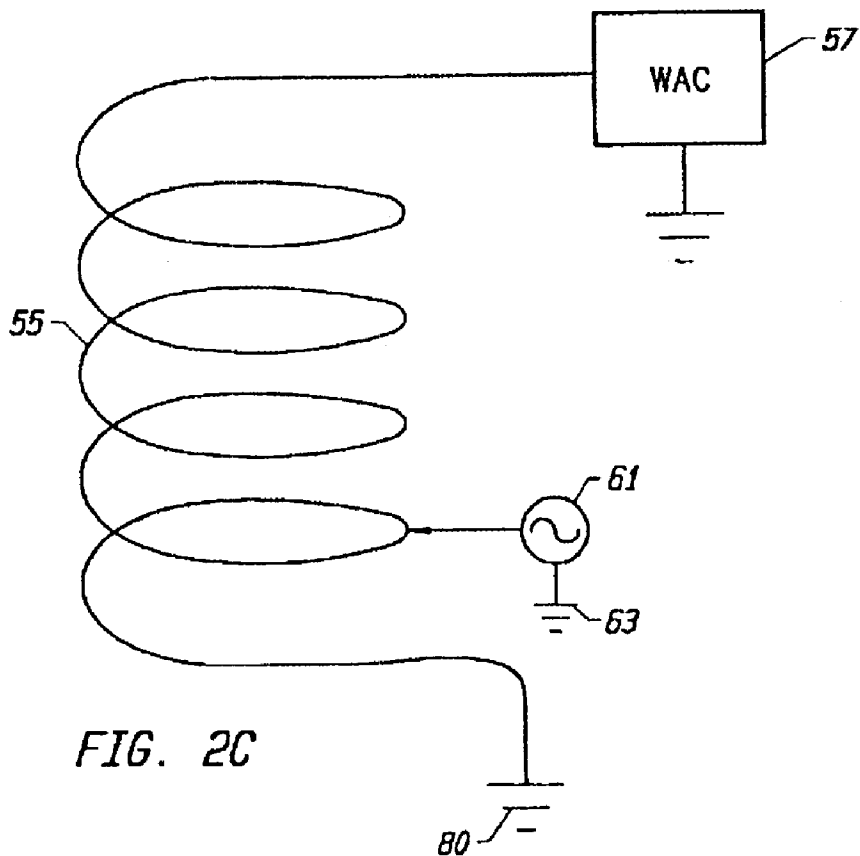


FIG. 2C

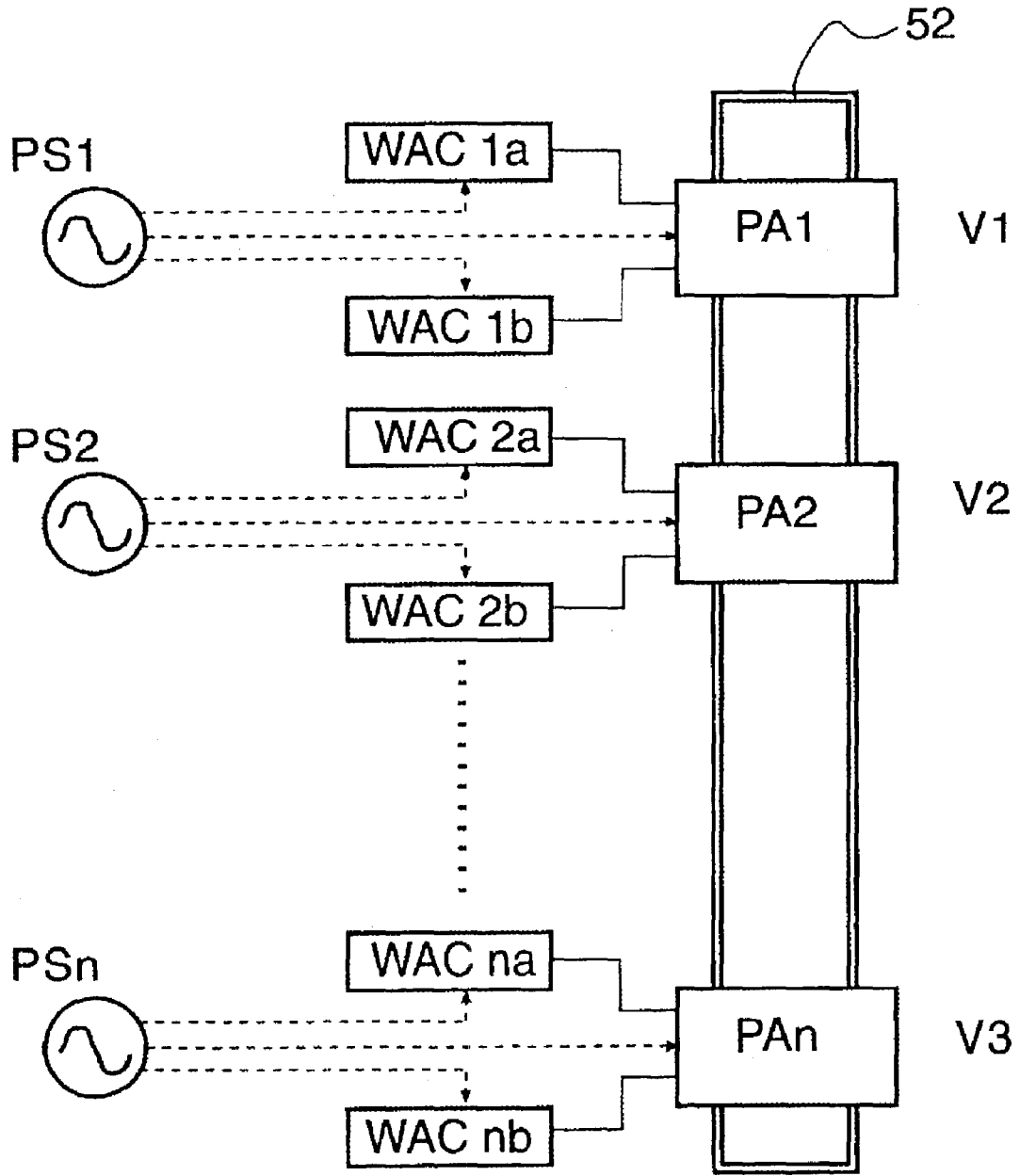


Fig. 2D

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