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**Flamm**

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- (54) **MULTI-TEMPERATURE PROCESSING**
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- (21) Appl. No.: **10/439,245**
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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	Rossmann 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.	

**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

**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**

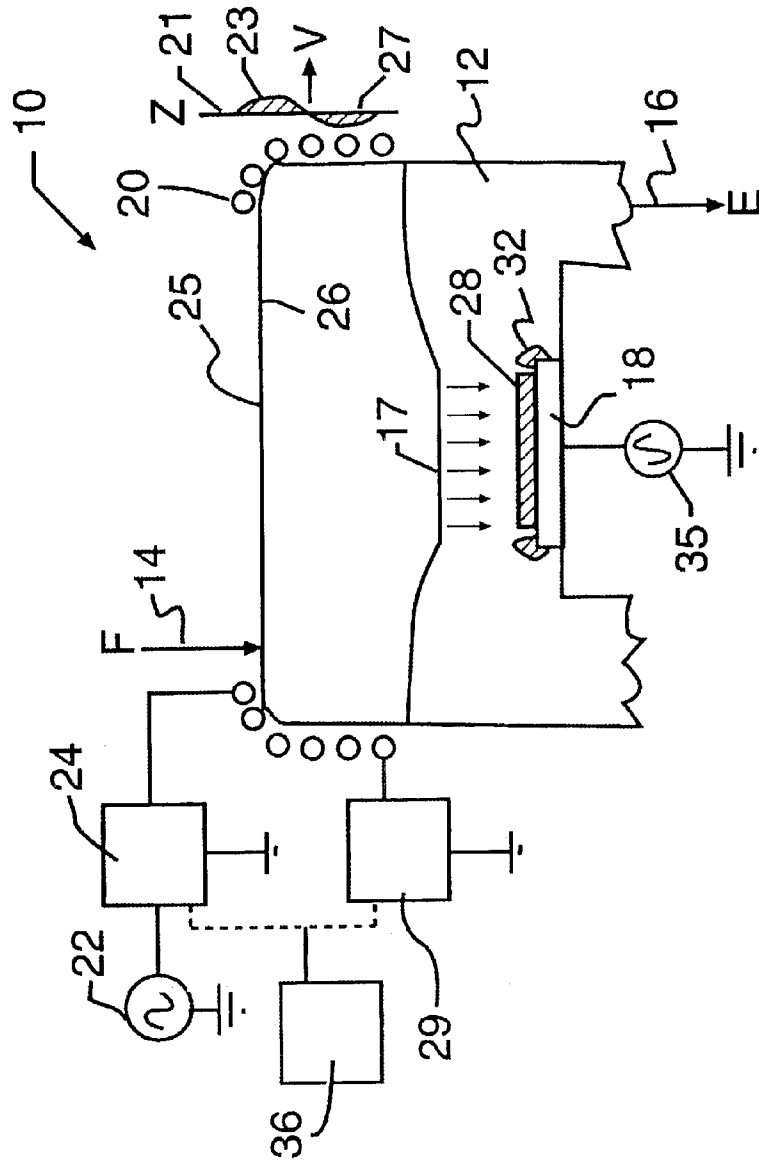


FIG. 1

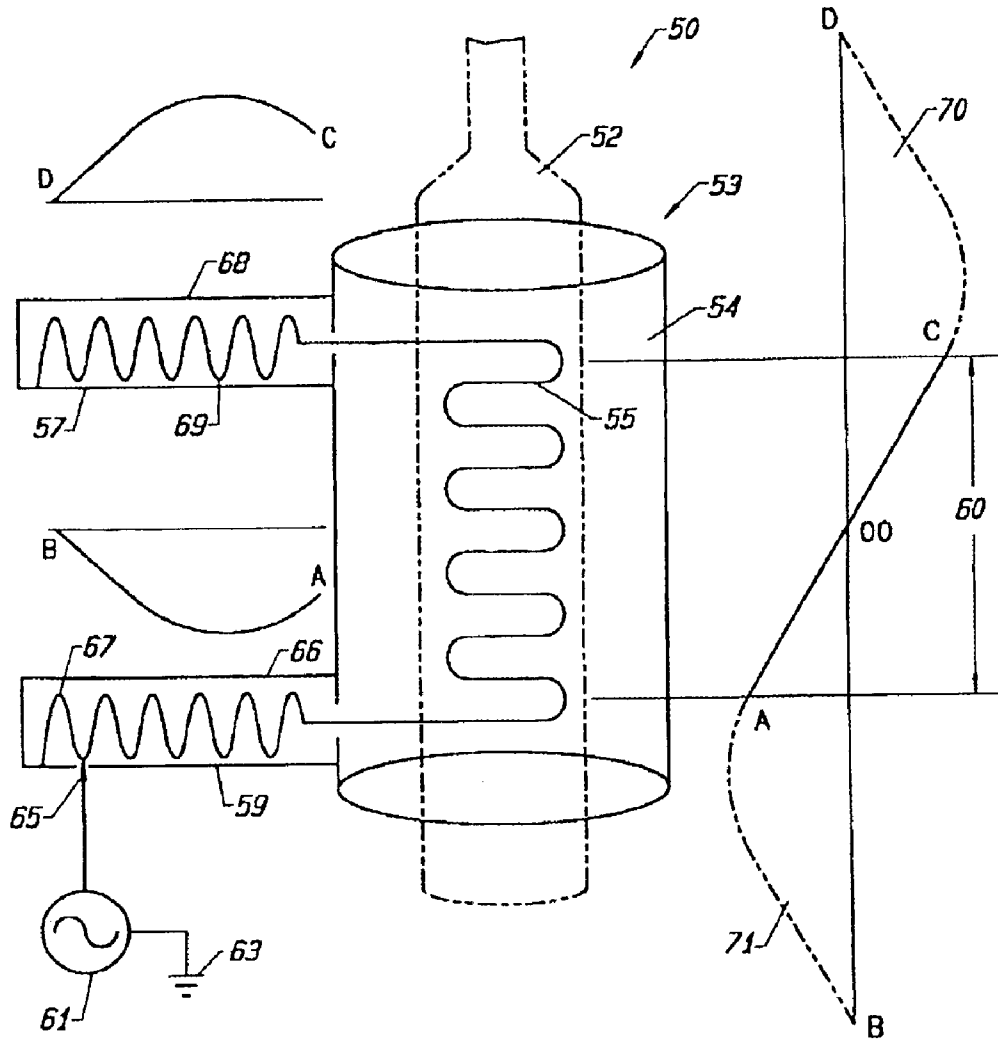


FIG. 2A

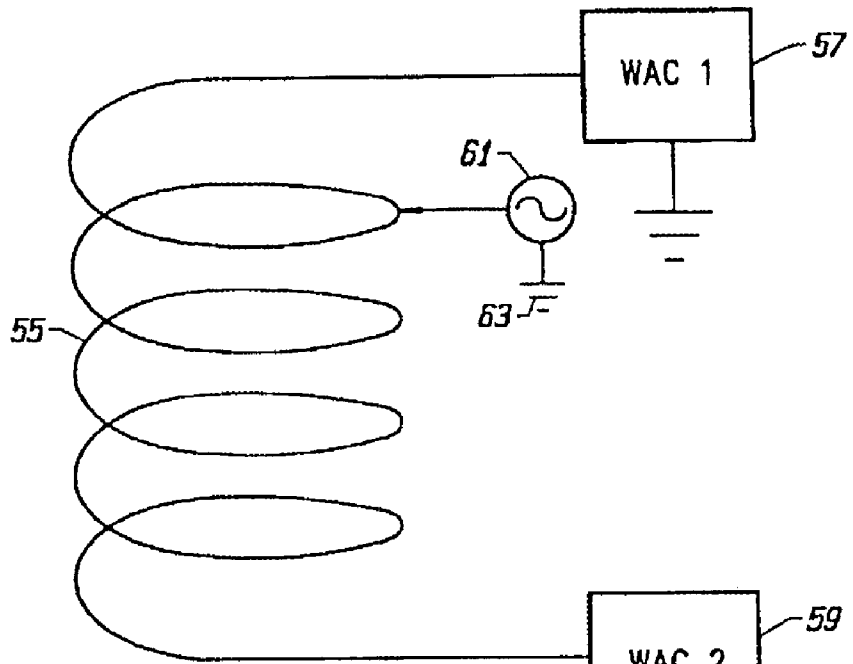


FIG. 2B

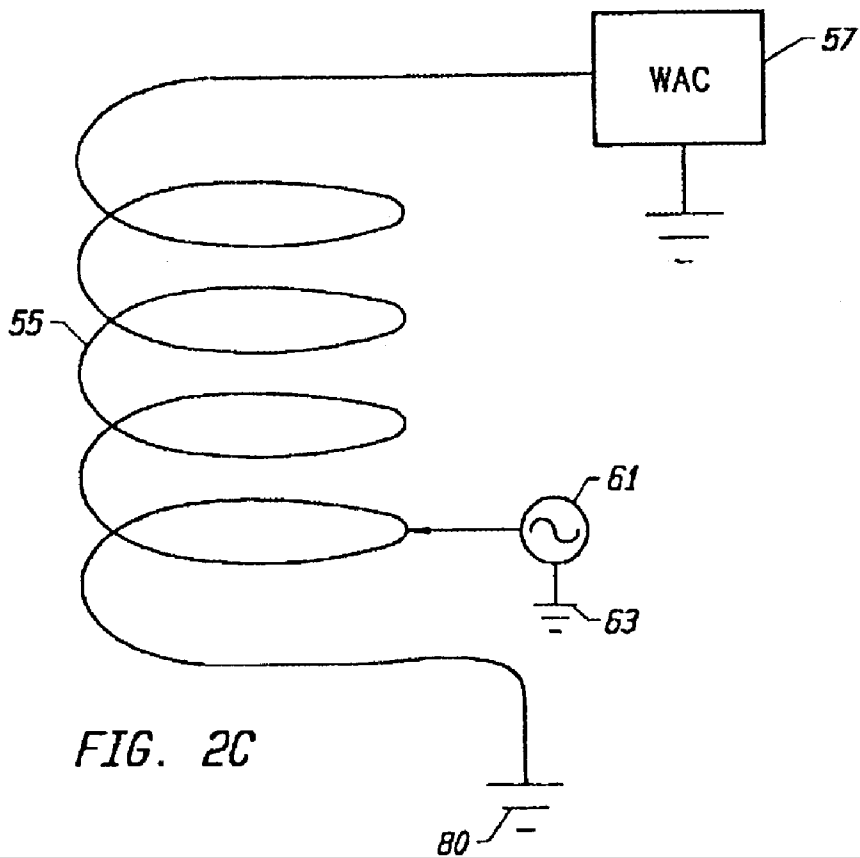


FIG. 2C

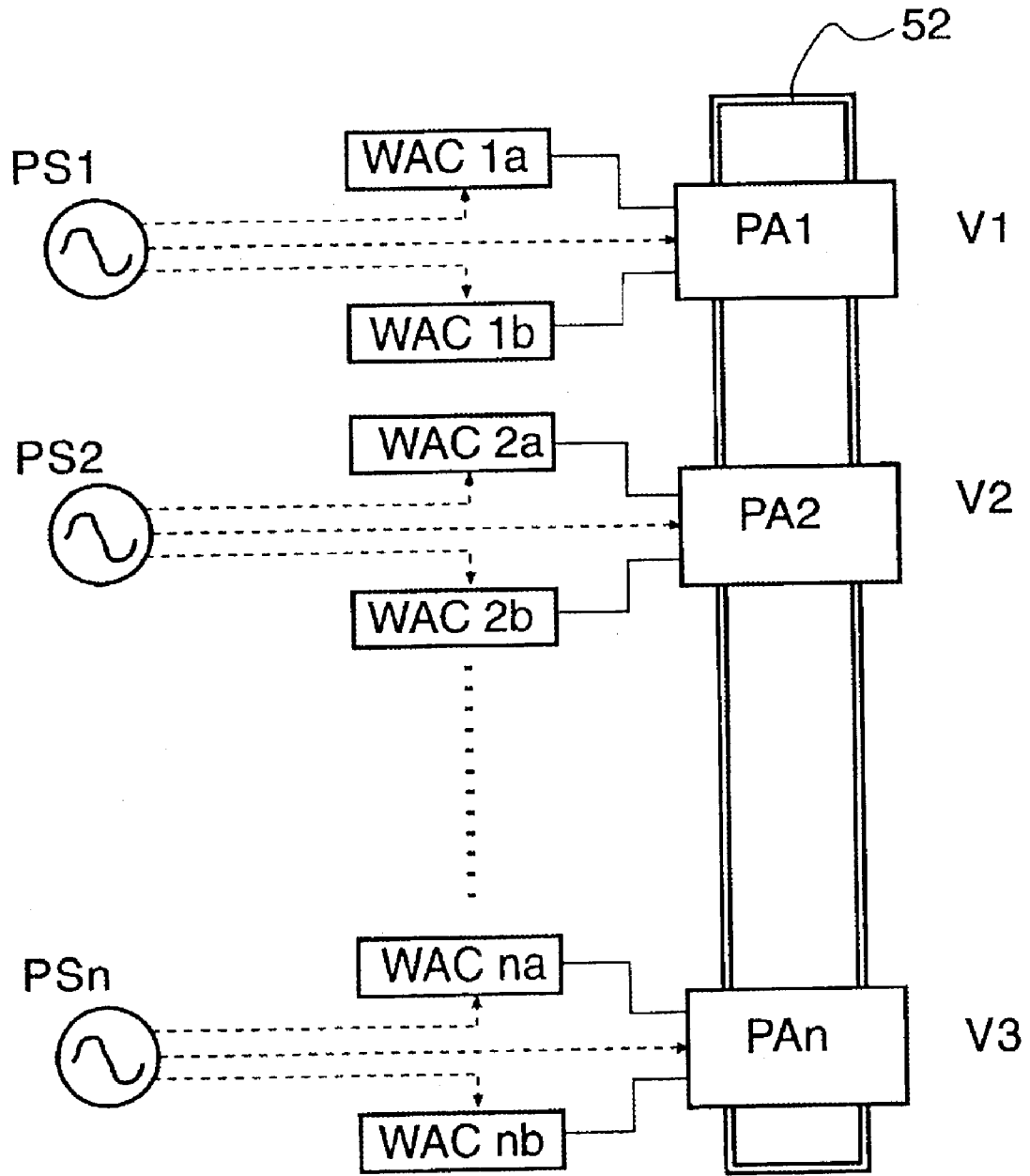


Fig. 2D

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