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United States Patent [19] Matsumura et al.

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- [54] **METHOD FOR HEAT-PROCESSING SEMICONDUCTOR DEVICE AND APPARATUS FOR THE SAME**
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- [73] Assignees: **Tokyo Electron Limited, Tokyo; Tokyo Electron Kyushu Limited, Kumamoto, both of Japan**

- [21] Appl. No.: **538,710**
- [22] Filed: **Jun. 15, 1990**
- [30] **Foreign Application Priority Data**

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- [51] Int. Cl.⁵ **H05B 3/68**
- [52] U.S. Cl. **364/557; 219/457; 219/464**
- [58] Field of Search **364/557, 505, 477; 219/405, 411, 388, 390, 457, 464, 465**

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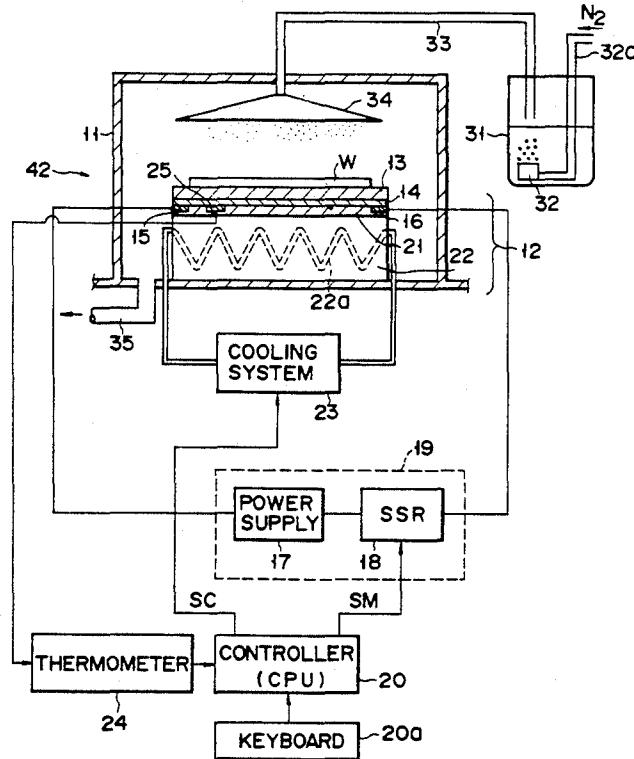
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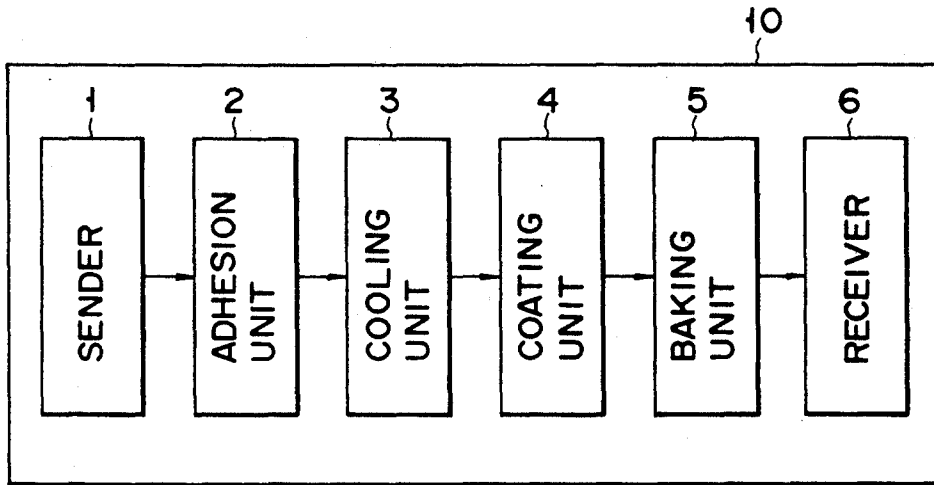
Primary Examiner—Joseph L. Dixon
 Attorney, Agent, or Firm—Oblon, Spivak, McClelland, Maier & Neustadt

[57] ABSTRACT

CPU stores information showing a time-temperature relationship and applicable for either heating a semiconductor wafer to a hold temperature for a predetermined period of time or cooling the wafer from the hold temperature over a predetermined period of time, or for both, read the information. A conductive thin film heats the wafer in accordance with the information. A sensor detects the temperature of the wafer. A control system controls either the heating of the wafer or the cooling thereof, or both, in accordance with the detected temperature signal and the information.

12 Claims, 8 Drawing Sheets





PRIOR ART

FIG. 1

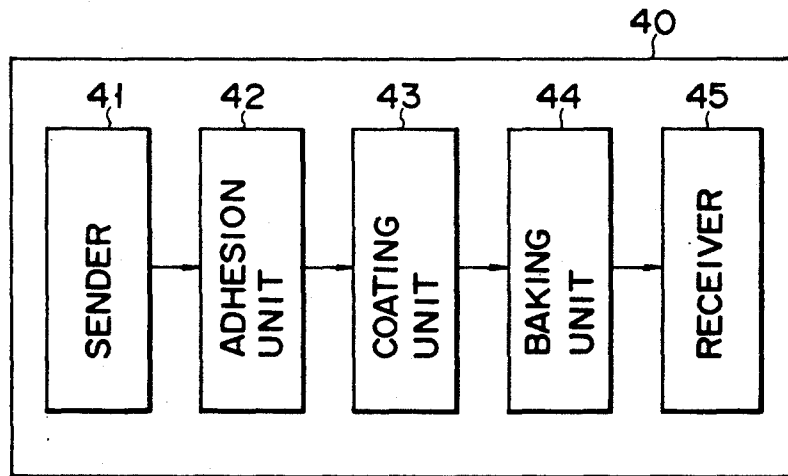
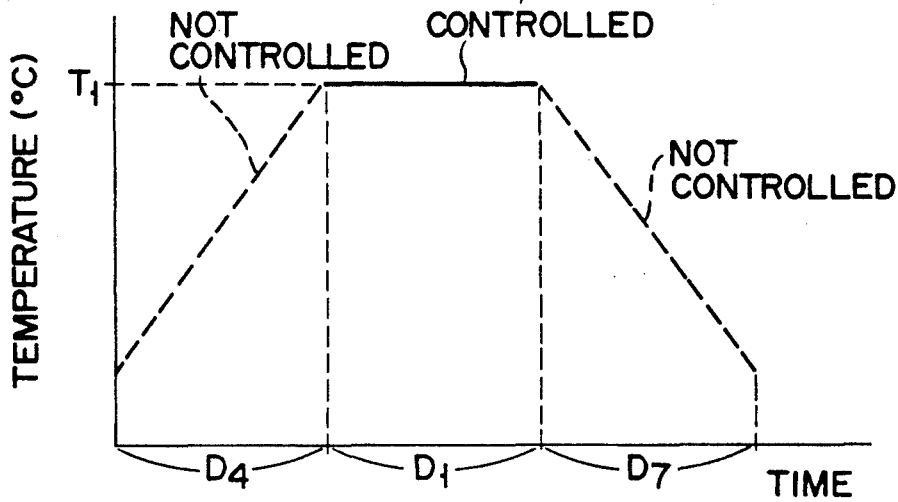
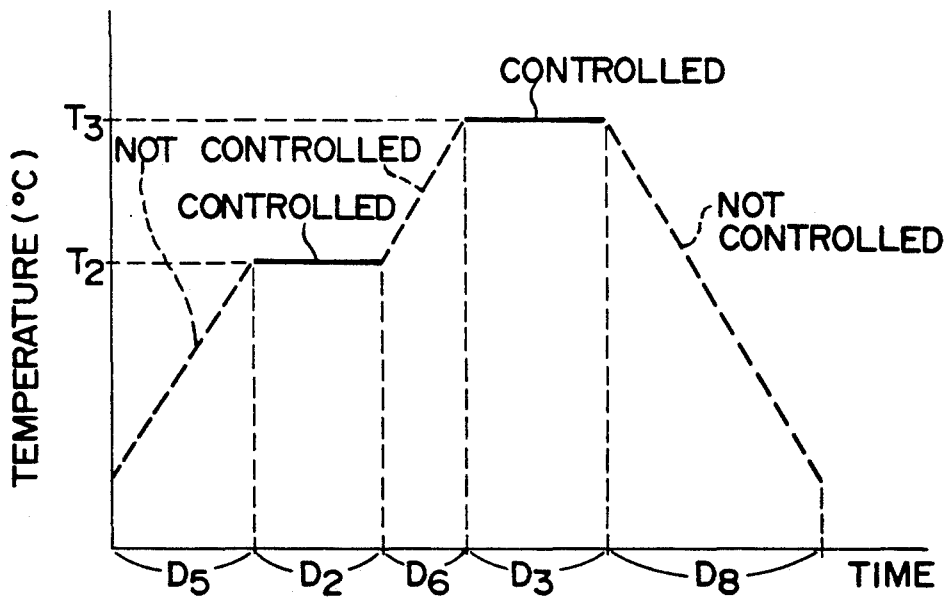


FIG. 4



PRIOR ART
FIG. 2



PRIOR ART
FIG. 3

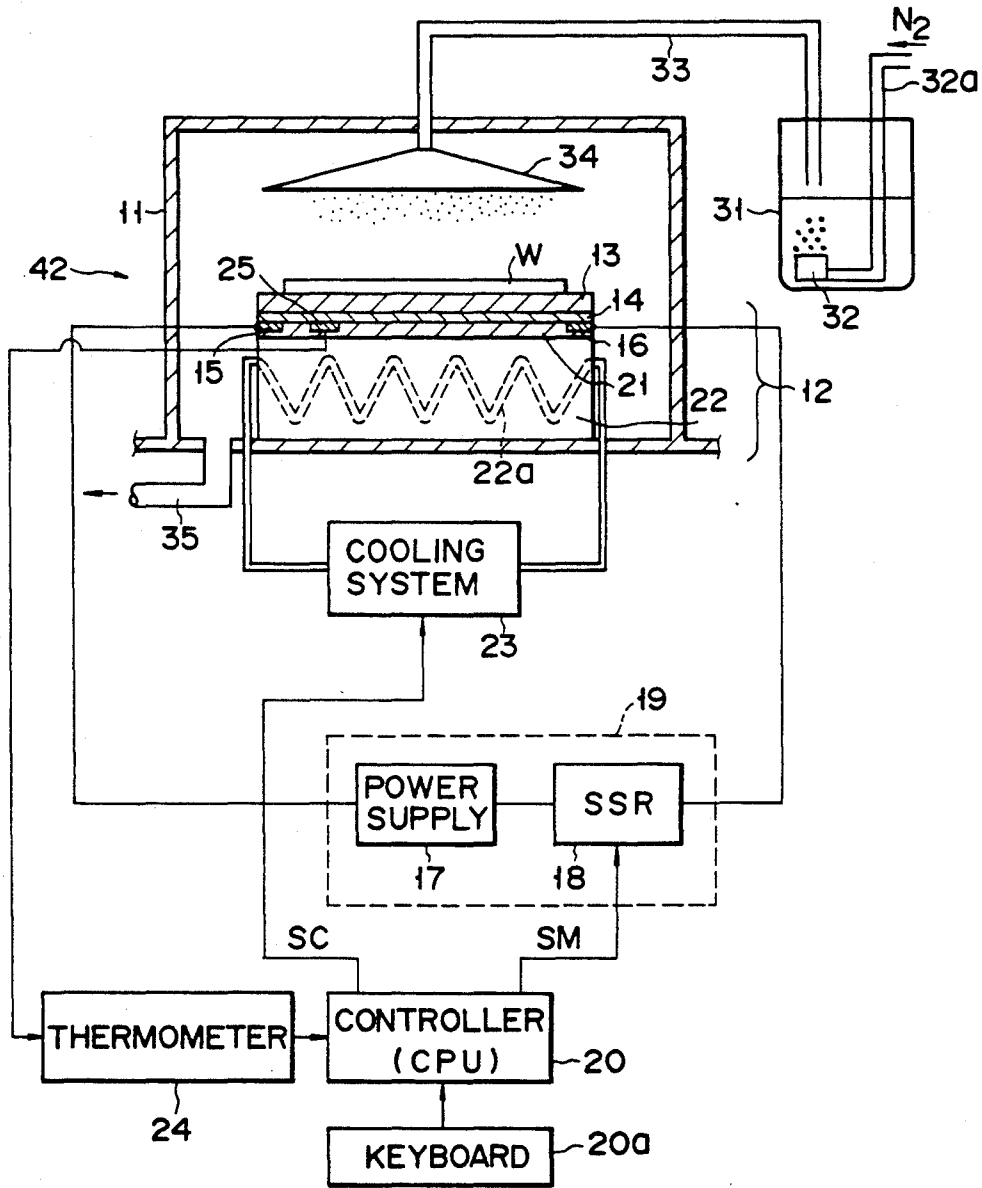


FIG. 5A

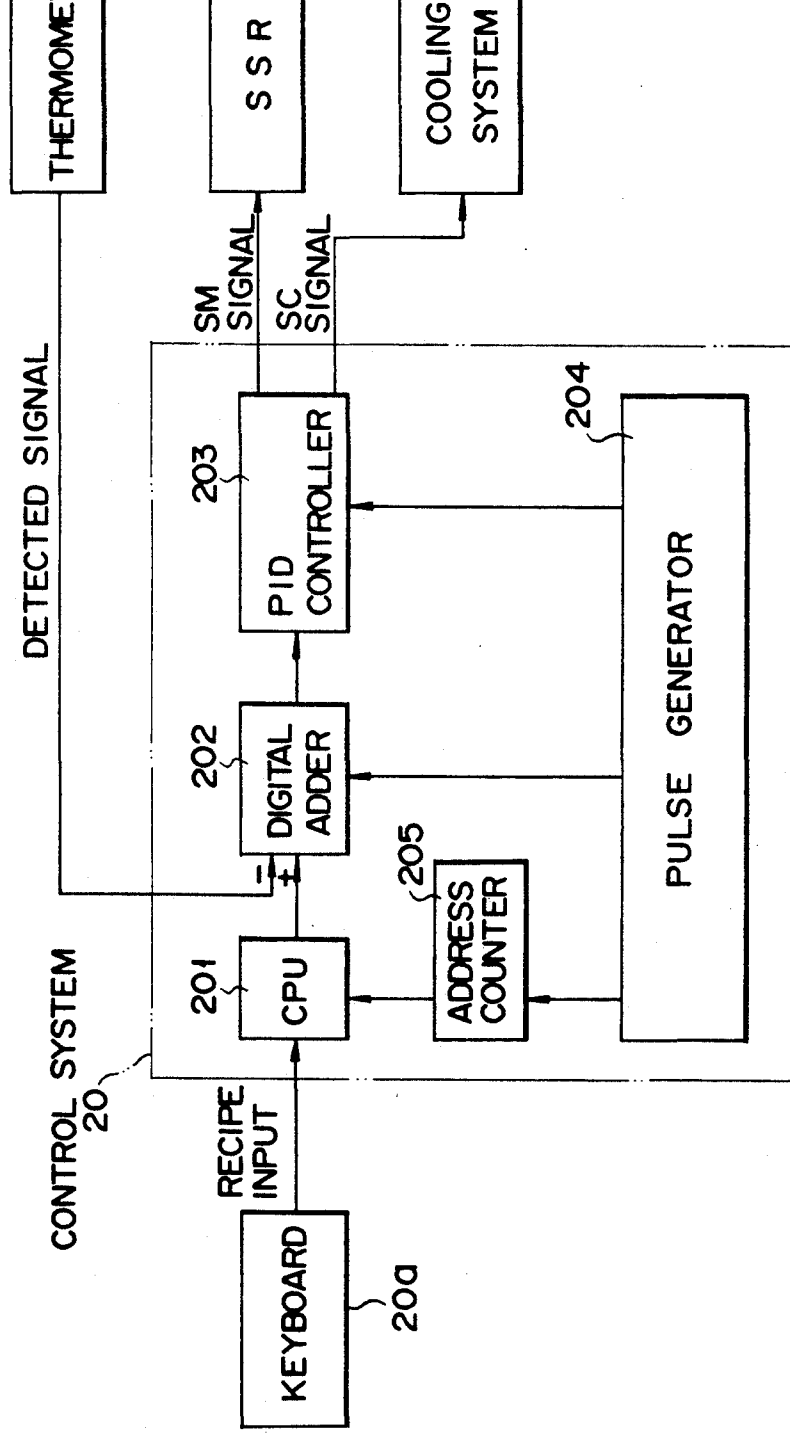


FIG. 5B

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