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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**

[75] Inventors: **Kimiharu Matsumura**, Kumamoto; **Hiroyuki Sakai**, Nishigoshi; **Masaaki Murakami**, Kumamoto; **Tetsuya Oda**, Tamana; **Chizo Yamaguchi**, Sencho, all of Japan

[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**

Jun. 16, 1989 [JP] Japan 1-154119
Oct. 24, 1989 [JP] Japan 1-276564

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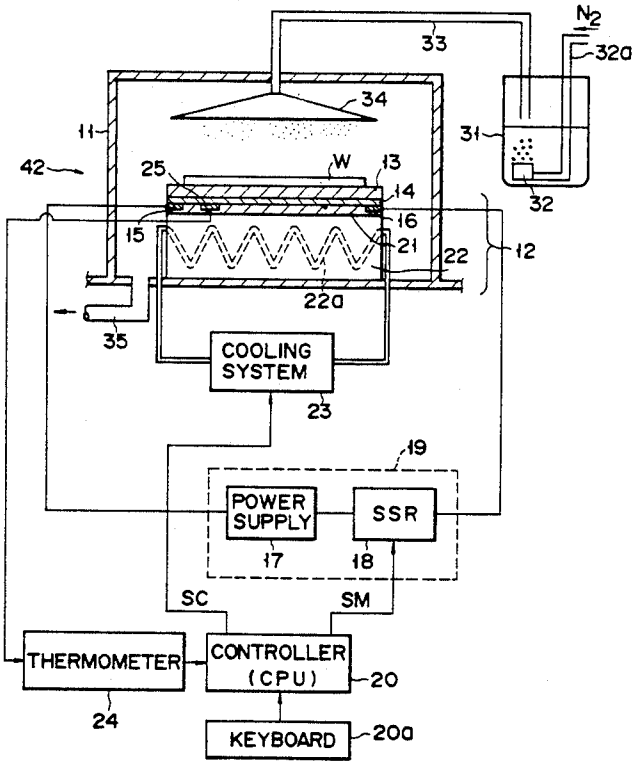
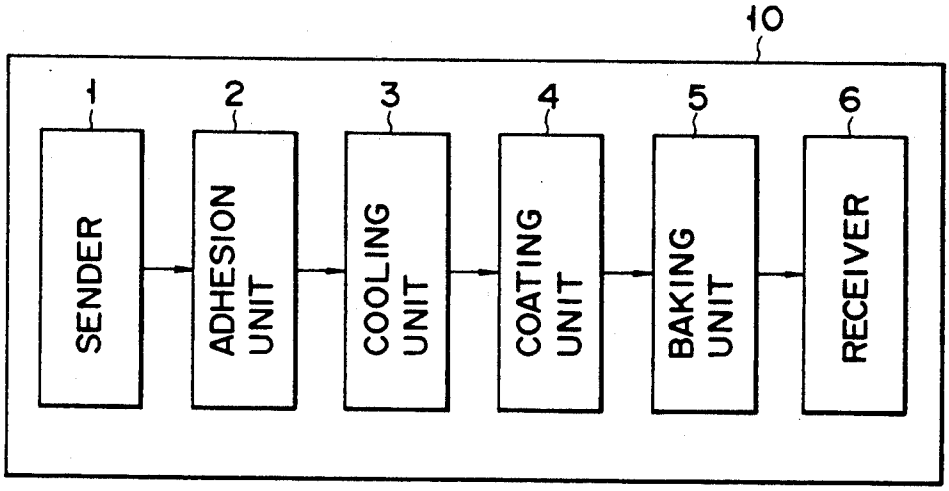
Primary Examiner—Joseph L. Dixon
Attorney, Agent, or Firm—Oblon, Spivak, McClelland, Maier & Neustadt

[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

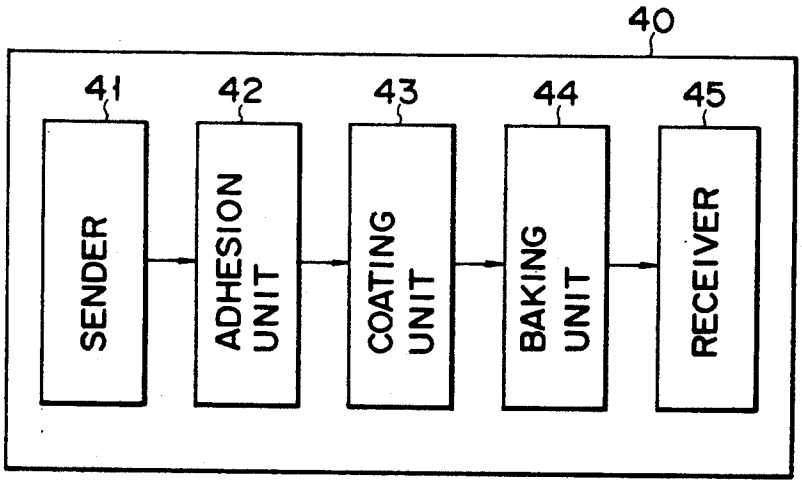
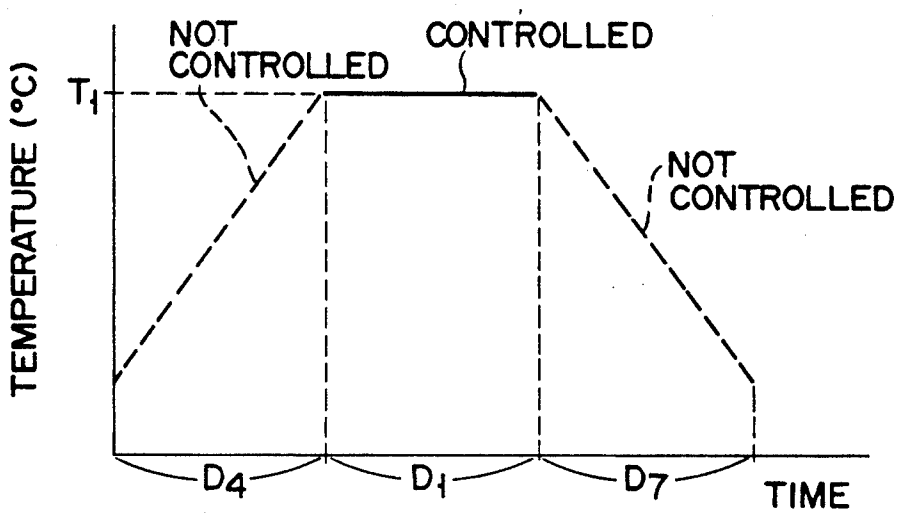
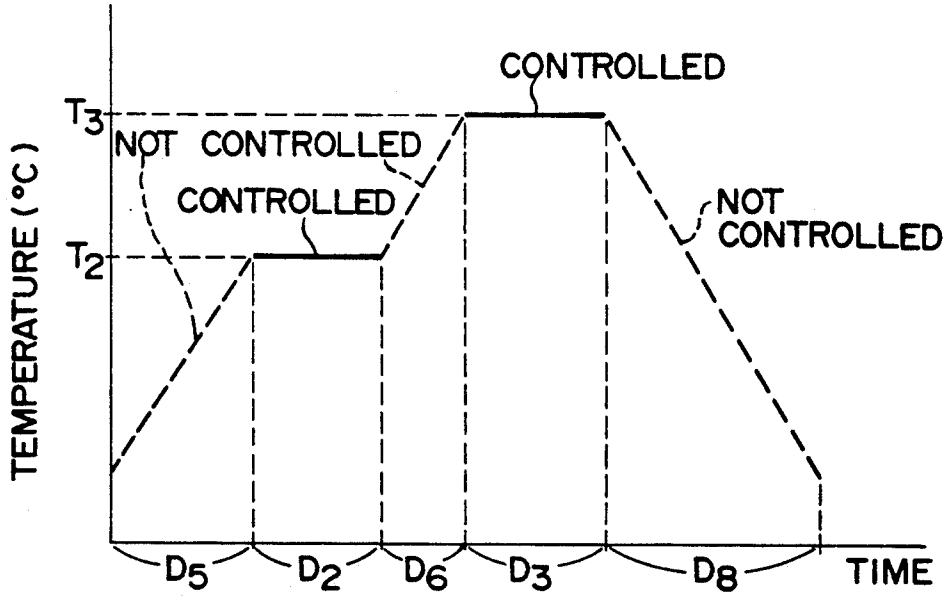


FIG. 4



PRIOR ART

FIG. 2



PRIOR ART

FIG. 3

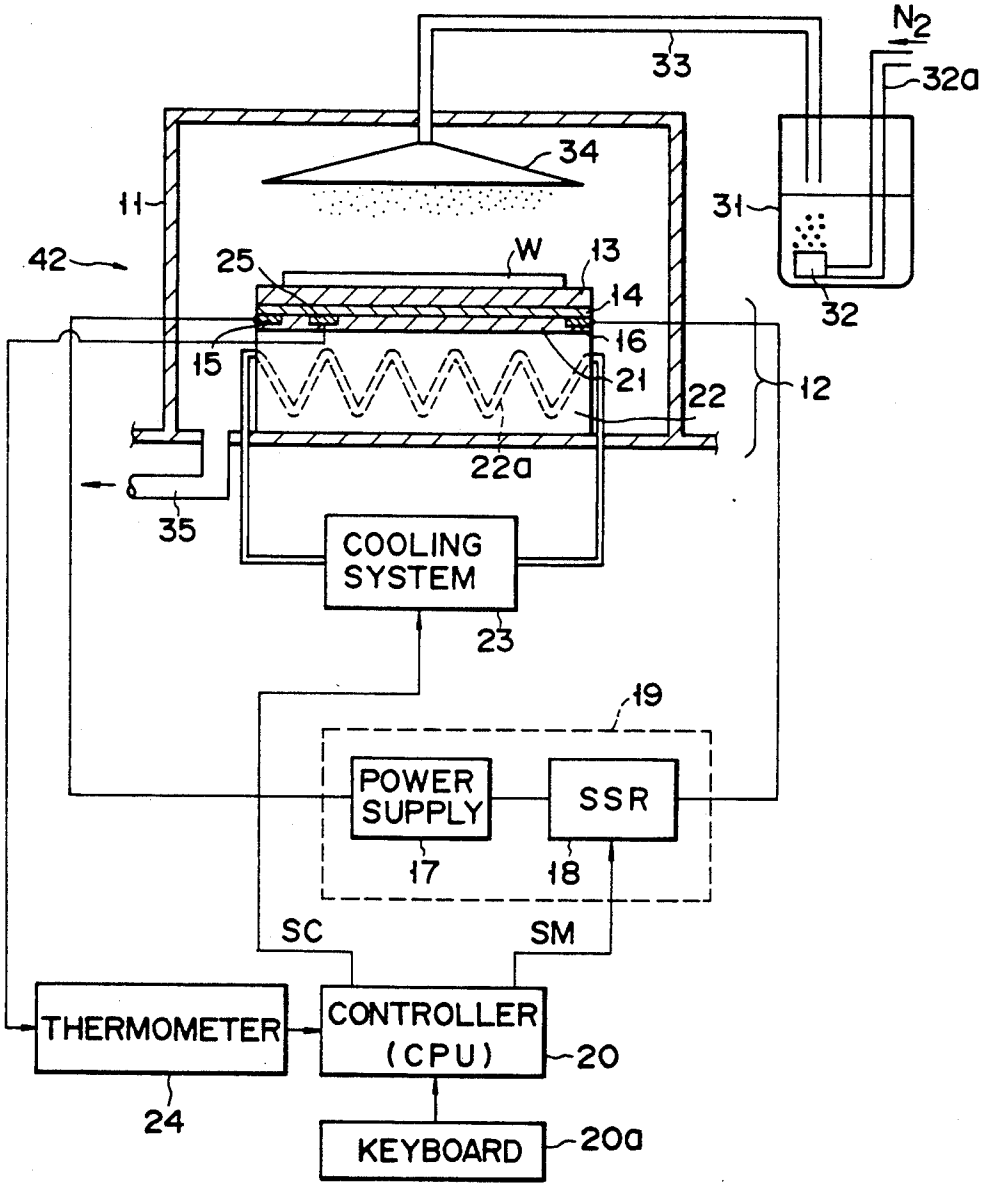


FIG. 5A

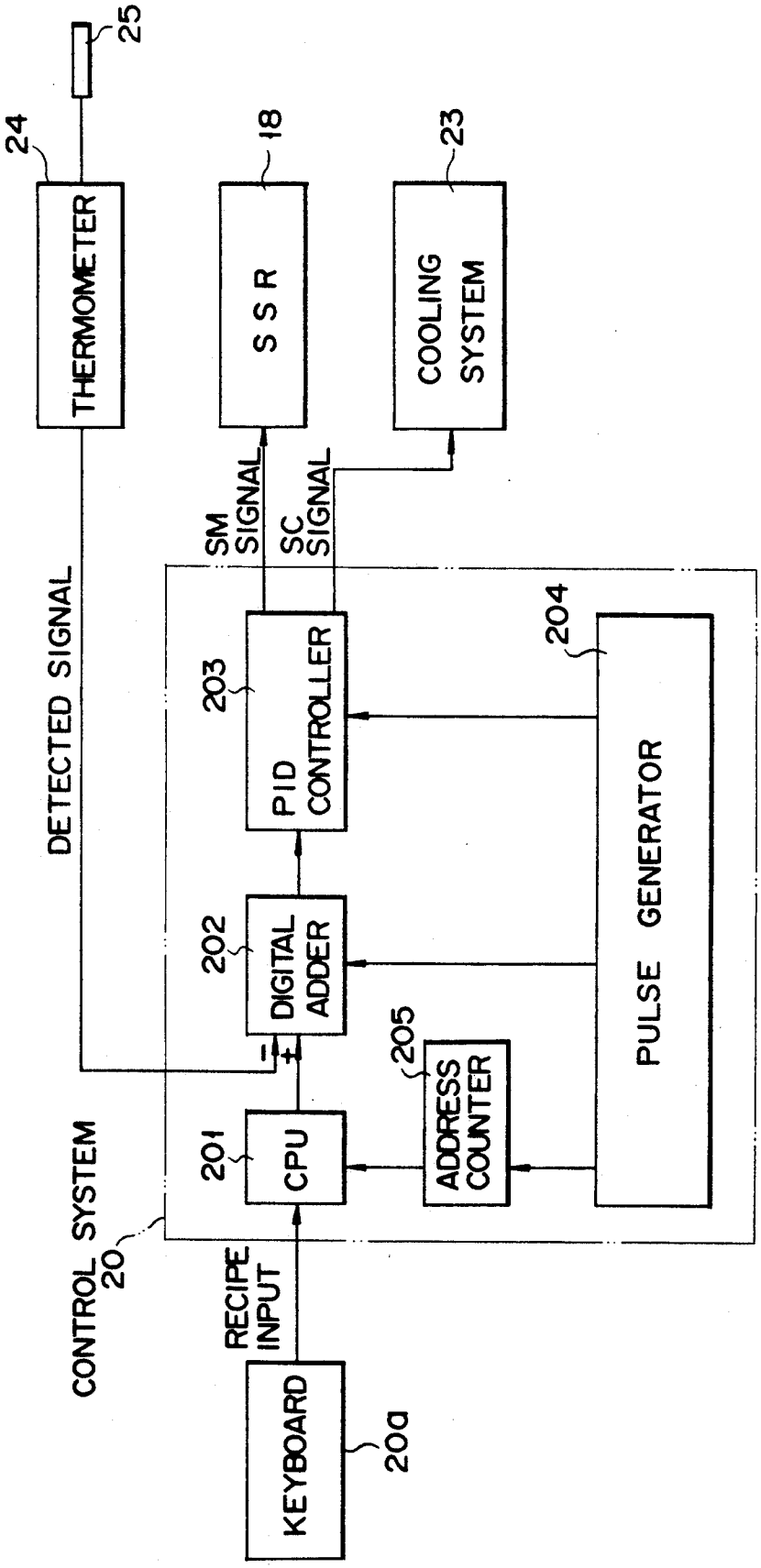


FIG. 5B

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