IPR2017-00279, -00280, -00281, -00282
U.S. Patent No. RE40,264

Intel Petitioners' Demonstratives

March 7, 2018

Intel, Exhibit 1033
Intel v. Flamm, IPR2017-00279

Obviousness Combinations

Petition	
-279	• **Muller, Matsumura, Anderson and Hinman render independent claim 13 obvious (as does the Kadomura combination)** • **Adding Kikuchi renders claim 17 obvious** • **Adding Wright renders claims 19-20 obvious**
-280 **-281**	• **Kadomura and Matsumura render independent claims 27, 37 and 51 obvious** • **Kikuchi and Matsumura also render those claims obvious**
-282	• **Patent owner failed to address Muller, Matsumura and Wang, which render independent claims 56 and 60 obvious** • **Adding Kikuchi renders claim 63 obvious**
All	• **Most dependent claims are not separately contested**

Temperature change and preselected time limitations

(19) **United States**
(12) **Reissued Patent**
Flamm

(10) Patent Number: **US RE40,264 E**
(45) Date of Reissued Patent: **Apr. 29, 2008**

13. wherein the thermal mass of the substrate holder is selected for a **predetermined temperature change within a specific interval of time** during processing; *the*

(64) Patent No.: 6,231,776
Issued: May 15, 2001

27. wherein **substrate temperature is changed** from the selected first substrate temperature to the selected second substrate temperature, using a measured substrate temperature, **within a preselected time interval** for processing, and at least the first substrate temperature or the second substrate temperature, in single or in combination, is above room temperature.

37. wherein the substrate holder is heated above room temperature during at least one of the first or the second film treatments, and the substrate temperature control circuit is operable to **change the substrate temperature from the selected first substrate temperature to the selected second substrate temperature within a preselected time period** to process the film.

Intel Corp. et al.   Exhibit 1001

51. the substrate temperature control circuit effectuates the **change from the first substrate temperature to the second substrate temperature within a preselected time period.**
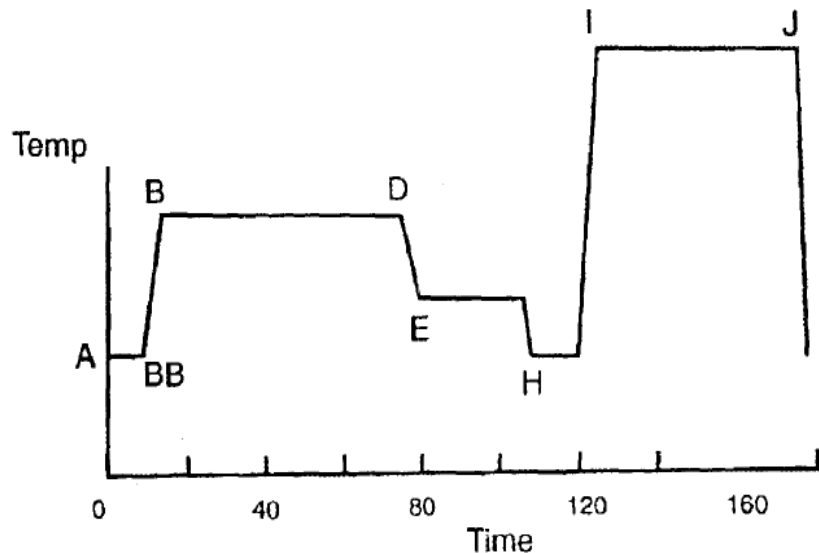
56. wherein the substrate holder is heated to a temperature operable to maintain at least one of the selected first and the selected second substrate temperatures above 49° C., and the **substrate temperature is changed** from the first substrate temperature to the second substrate temperature with a control circuit operable to effectuate the changing **within a preselected time period** that is less than the overall process time associated with the etching the first silicon-containing layer and the second silicon-containing layer.

60. wherein the first substrate temperature is different from the second substrate temperature and the first **substrate temperature is changed** to the second substrate temperature with a substrate temperature control circuit **within a preselected time** to etch the silicide layer.

'264 patent (Ex. 1001), claims 13, 27, 37, 51, 56, 60

Matsumura, like the '264 patent, relies on temperature changes in a preselected time period
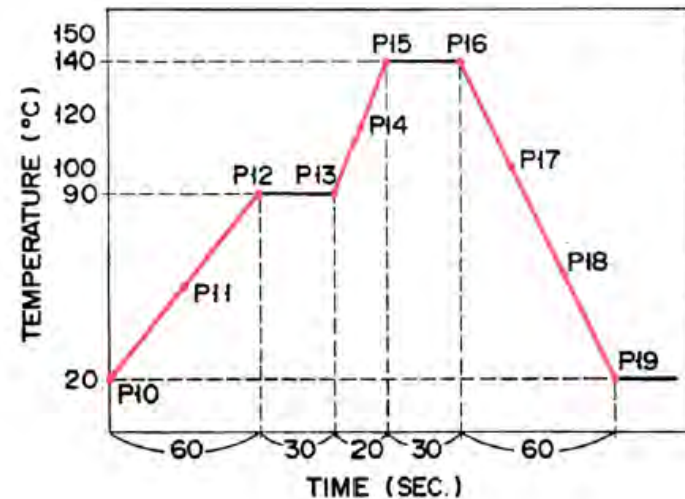

'264 patent (Ex. 1001), Fig. 10

FIG. 9

(I) A recipe shown in FIG. 9 is inputted into the PID controller 203 by the keyboard 20a. Points P10 to P19 are set in the recipe so as to surely reproduce the thermal history curve of the wafer W. Information relating to temperatures and times at these points P10 to P19 is inputted as a command temperature table to the CPU 201. In the case of this recipe, the heating speed at a first

Matsumura (Ex. 1003), Fig. 9, 8:56-62

-280 Petition at 6-7, 14-15, 32; -280 Bravman Decl. ¶¶51, 71, 97, 129; -280 Reply at 3-4

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Intel, Exhibit 1033
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Matsumura, like the '264 patent, relies on temperature changes in a preselected time period

Still further, the present invention has been applied to the adhesion and baking processes for semiconductor wafers in the above-described embodiments, but it can also <mark>be applied to any of</mark> the ion implantation, <mark>CVD, etching and ashing processes.</mark>

The object of the present invention is therefore to provide a simpler method of heat-processing semiconductor devices whereby temperatures of the semiconductor devices can be controlled at devices-heating and -cooling times so as to <mark>accurately control their thermal history curve.</mark>

Further, when the semiconductor devices of same kind are to be heated and cooled, their thermal history curve can be <mark>controlled accurately same</mark> at their heating and cooling times, thereby <mark>enhancing their reliability.</mark> Particularly, their thermal history curve can be made accurately same. Therefore, no irregularity can be found in the property of their resists, and their <mark>qualities can be made same.</mark>
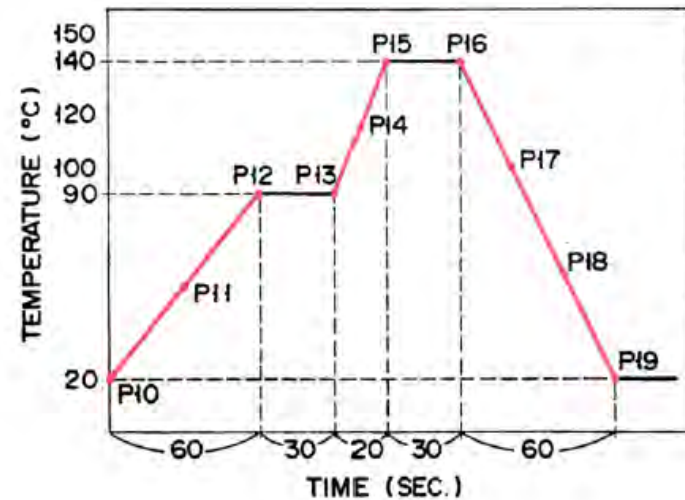

FIG. 9

Matsumura (Ex. 1003), Fig. 9, 10:3-7, 2:60-65, 10:22-29

-280 Petition at 6-7, 14-15, 32-34; -280 Bravman Decl. ¶¶51, 70-71, 129, 133-134; -280 Reply at 3-4

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