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United States Patent [19]

Cleeves

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[54] **METHOD FOR REDUCED PITCH LITHOGRAPHY**

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[73] Assignee: **Cypress Semiconductor Corporation**, Calif.

[21] Appl. No.: **740,145**

[22] Filed: **Oct. 22, 1996**

Related U.S. Application Data

[63] Continuation of Ser. No. 361,595, Dec. 22, 1994, abandoned.

[51] **Int. Cl.**[6] **G03F 7/20**

[52] **U.S. Cl.** **430/315**; 430/313; 430/328; 430/330

[58] **Field of Search** 430/311, 313, 430/315, 324, 328, 330

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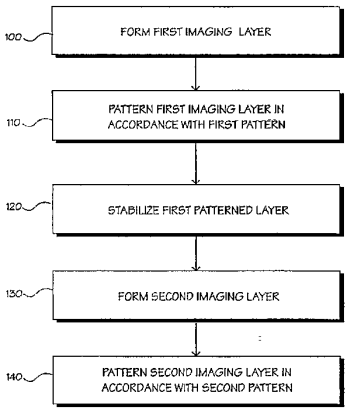
[57] **ABSTRACT**

A lithographic patterning process uses multiple exposures to provide for relatively reduced pitch for features of a single patterned layer. A first imaging layer is exposed to radiation in accordance with a first pattern and developed. The resulting patterned layer is stabilized. A second imaging layer is subsequently formed to surround the first patterned layer, exposed to radiation in accordance with a second pattern, and developed to form a second patterned layer. As the first patterned layer has been stabilized, the first patterned layer remains with the second patterned layer to produce a single patterned layer. For another embodiment, a single imaging layer is patterned by exposure to radiation in accordance with two separate patterns. An exposed portion of the imaging layer is suitably stabilized to withstand subsequent lithographic process steps.

16 Claims, 10 Drawing Sheets



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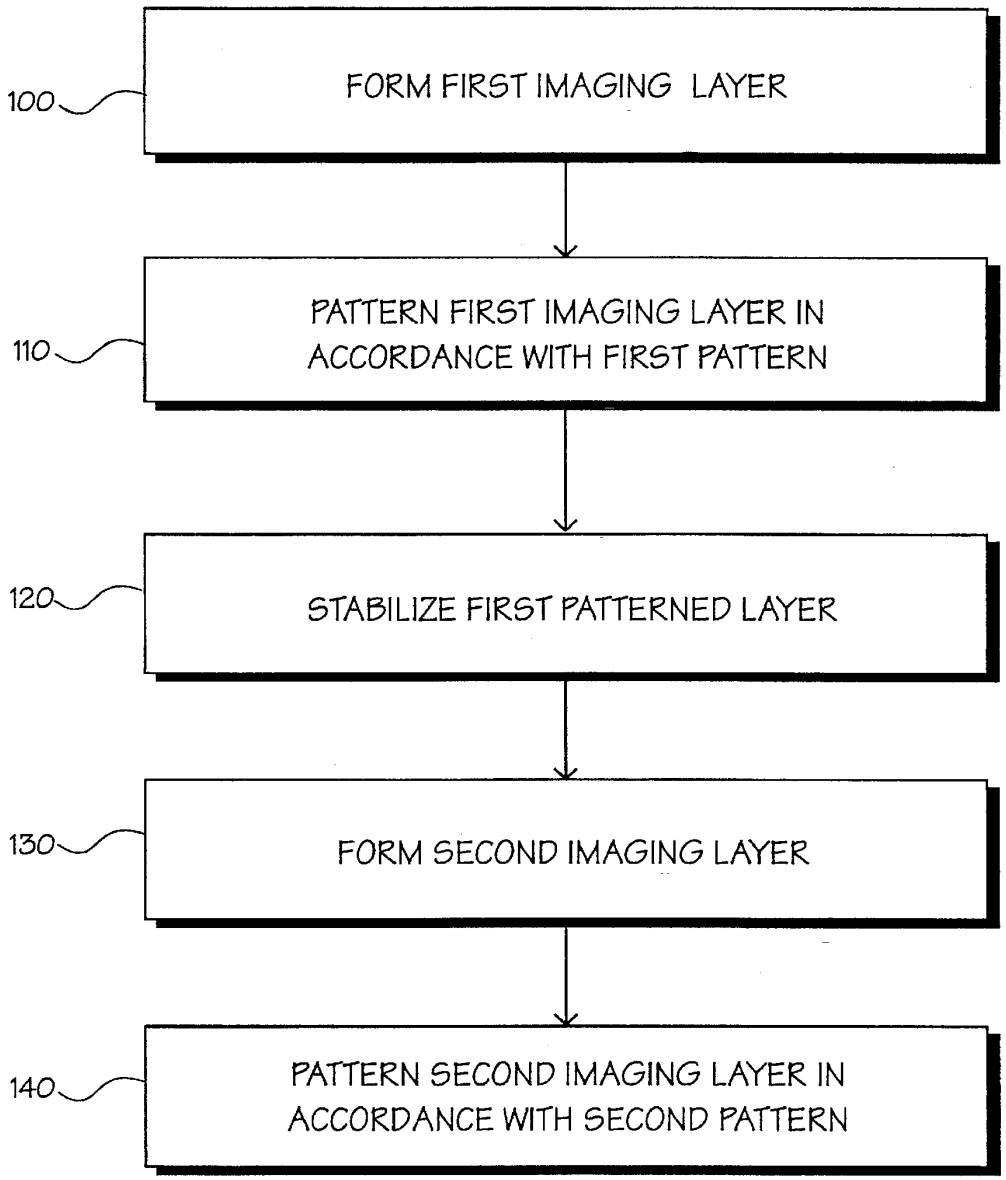

Fig.1

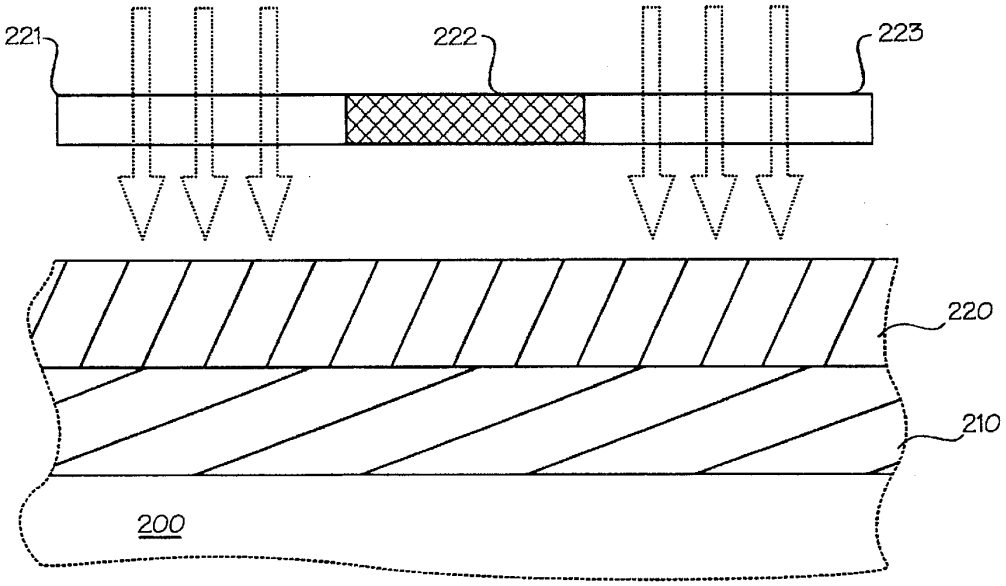

Fig.2

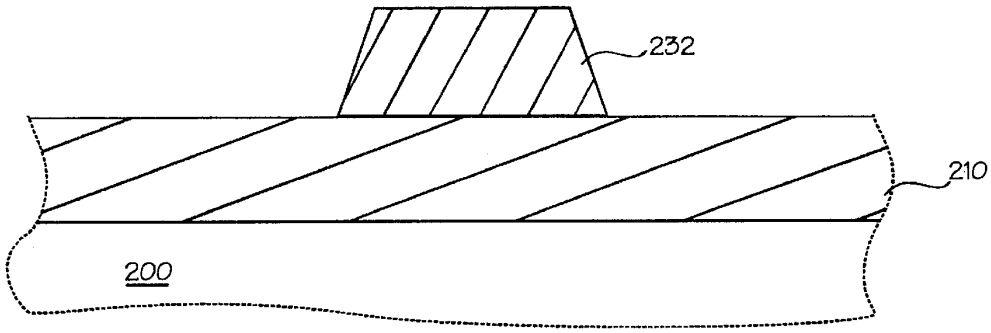

Fig.3

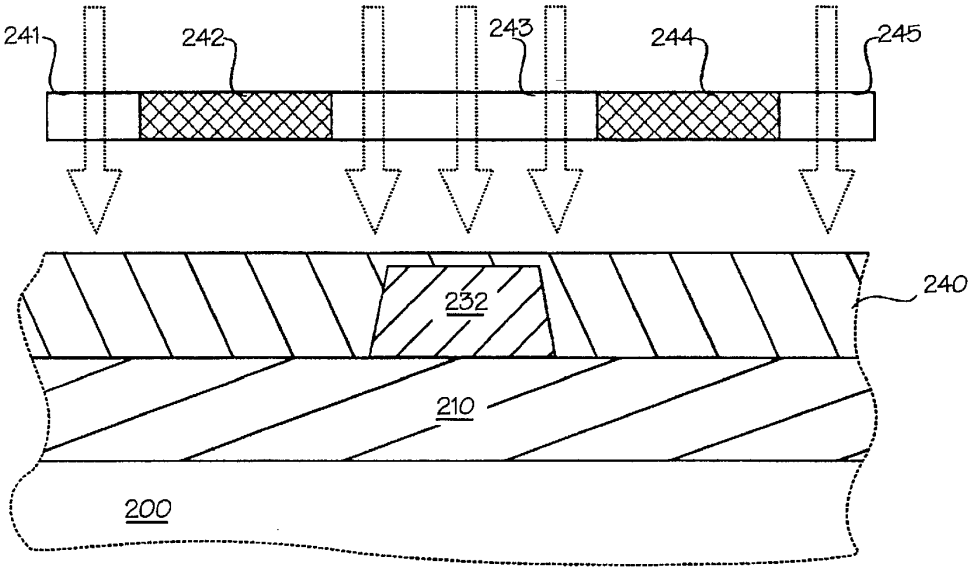

Fig4

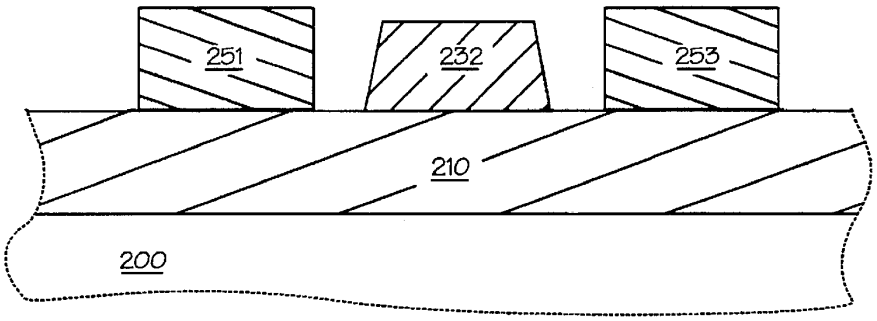

Fig.5

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