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Declarations under Rule 4.17:

[Continued on next page]

(54) **Title**: IMPROVED SUBSTRATE TEMPERATURE CONTROL BY USING LIQUID CONTROLLED MULTIZONE SUBSTRATE SUPPORT

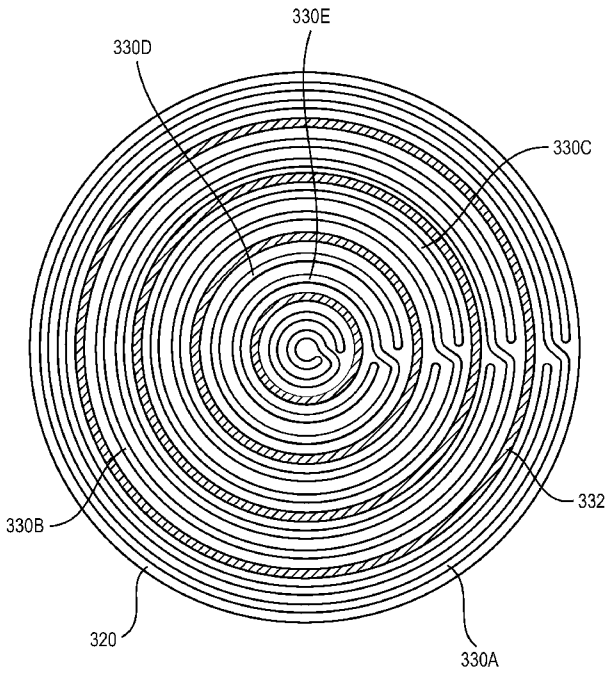

FIG. 6

(57) **Abstract**: A substrate support useful in a reaction chamber of a plasma processing apparatus is provided. The substrate support comprises a base member and a heat transfer member overlying the base member. The heat transfer member has multiple zones to individually heat and cool each zone of the heat transfer member. An electrostatic chuck overlies the heat transfer member. The electrostatic chuck has a support surface for supporting a substrate in a reaction chamber of the plasma processing apparatus. A source of cold liquid and a source of hot liquid are in fluid communication with flow passages in each zone. A valve arrangement is operable to independently control temperature of the liquid by adjusting a mixing ratio of the hot liquid to the cold liquid circulating in the flow passages. In another embodiment, heating elements along a supply line and transfer lines heat a liquid from a liquid source before circulating in the flow passages.

WO 2010/055441 A3

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