(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
22 July 2004 (22.07.2004)

PCT

(10) International Publication Number
WO 2004/061920 A2

(51) International Patent Classification[7]: H01L 21/20

(21) International Application Number:
PCT/US2003/034673

(22) International Filing Date: 30 October 2003 (30.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/335,447 31 December 2002 (31.12.2002) US

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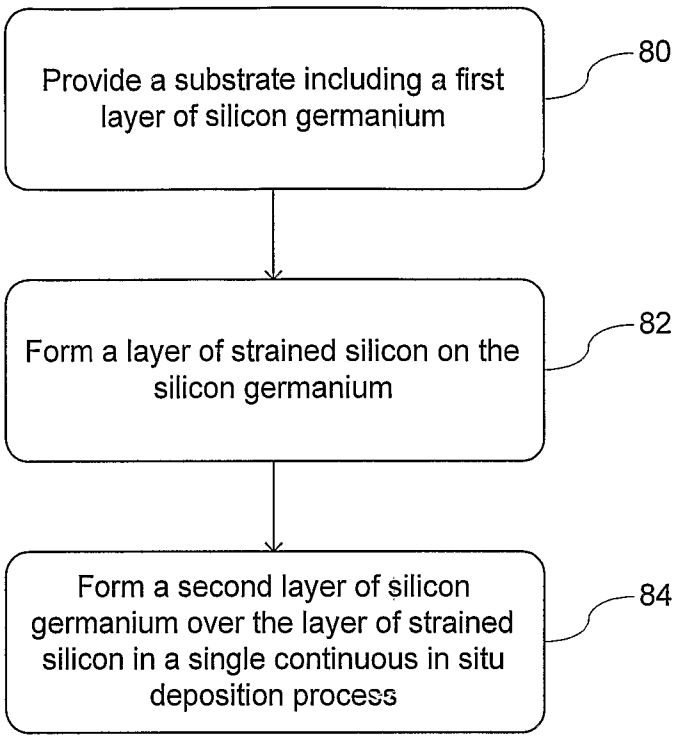
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *without international search report and to be republished upon receipt of that report*

[Continued on next page]

(54) Title: METHOD OF FORMING A THICK STRAINED SILICON LAYER AND SEMICONDUCTOR STRUCTURES INCORPORATING A THICK STRAINED SILICON LAYER



(57) Abstract: A strained silicon layer (50) s grown on a layer of silicon germanium (40) and a layer of silicon germanium (52) is grown on the strained silicon (50) in a single continuous in situ deposition process with the strained silicon (50). Shallow trench isolations (48) are formed in the lower layer of silicon germanium (40) prior to formation of the strained silicon layer (50). The two silicon germanium layers (40, 52) effectively provide dual substrates at both surfaces of the strained silicon layer (50) that serve to maintain the tensile strain of the strained silicon layer (50) and resist the formation of misfit dislocations that might otherwise result from temperature changes during processing. Consequently the critical thickness of strained silicon (50) that can be grown without significant misfit dislocations during later processing is effectively doubled for a given germanium content of the silicon germanium layers (40, 52). The formation of shallow trench isolations (48) prior to formation of the strained silicon layer (50) avoids subjecting the strained silicon (50) layer to extreme thermal stresses and further reduces the formation of misfit dislocations.

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