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- (81) 指定国 (除另有指明, 要求每一种可提供的国家保护): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW。
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(54) Title: GAS INJECTION DEVICE OF SEMICONDUCTOR HEAT TREATMENT APPARATUS, AND SEMICONDUCTOR HEAT TREATMENT APPARATUS

(54) 发明名称: 半导体热处理设备的气体喷射装置及半导体热处理设备

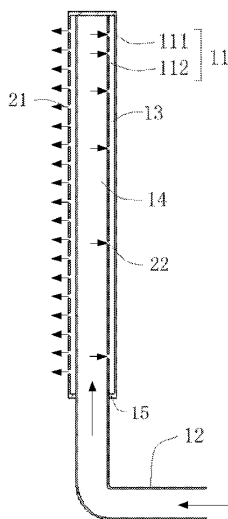


图 2

(57) Abstract: Provided are a gas injection device of a semiconductor heat treatment apparatus, and a semiconductor heat treatment apparatus (100). The device comprises: a gas intake pipe (1, 3, 5), and a first pipe section (11, 31, 51) comprising a first pipe wall (111, 311, 511) and a second pipe wall (112, 312, 512) nested in the first pipe wall (111, 311, 511), wherein a buffer space (13, 33, 53) is formed between an inner wall of the first pipe wall (111, 311, 511) and an outer wall of the second pipe wall (112, 312, 512); a plurality of first gas holes (21, 41, 61) are uniformly distributed in the first pipe wall (111, 311, 511) in a vertical direction, and the first gas holes (21, 41, 61) are respectively in communication with the buffer space (13, 33, 53) and a process chamber; a plurality of second gas holes (22, 42, 62) are provided in the second pipe wall (112, 312, 512), and the second gas holes (22, 42, 62) are respectively in communication with an inner space (14, 34, 54) of the second pipe wall (112, 312, 512) and the buffer space (13, 33, 53); and the change rule of an inner diameter of the second pipe wall (112, 312, 512) in a vertical direction and/or the arrangement rule of the plurality of second gas holes (22, 42, 62) can satisfy the condition of the gas output of a process gas flowing into the buffer space (13, 33, 53) via the plurality of second gas holes (22, 42, 62) being the same at different positions in a vertical direction. In this way, it can be ensured that different wafers (106) can obtain a uniform amount of gas, thereby ensuring the uniformity of the thickness of film formation of the wafers (106) and the consistency of process results.

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CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU,
IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT,
RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI,
CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG)。

本国际公布：

— 包括国际检索报告(条约第21条(3))。

(57) 摘要：提供一种半导体热处理设备的气体喷射装置及半导体热处理设备(100)，该装置包括进气管(1, 3, 5)，第一管段(11, 31, 51)包括第一管壁(111, 311, 511)和嵌套在第一管壁(111, 311, 511)中的第二管壁(112, 312, 512)，且第一管壁(111, 311, 511)的内壁与第二管壁(112, 312, 512)的外壁之间构成缓冲空间(13, 33, 53)；在第一管壁(111, 311, 511)上沿竖直方向均匀分布有多个第一气孔(21, 41, 61)，第一气孔(21, 41, 61)分别与缓冲空间(13, 33, 53)和工艺腔室相连通；在第二管壁(112, 312, 512)上设置有多个第二气孔(22, 42, 62)，第二气孔(22, 42, 62)分别与第二管壁(112, 312, 512)的内部空间(14, 34, 54)和缓冲空间(13, 33, 53)相连通；第二管壁(112, 312, 512)的内径在竖直方向上的变化规则和/或多个第二气孔(22, 42, 62)的排布规则满足：使经由多个第二气孔(22, 42, 62)流入缓冲空间(13, 33, 53)中的工艺气体在竖直方向上不同位置处的出气量相同。可以保证不同晶圆(106)能够获得均匀的气体流量，进而可以保证晶圆(106)成膜的厚度均匀性及工艺结果一致性。