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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
11 November 2021 (11.11.2021)

WIPO | PCT

(10) International Publication Number
WO 2021/225790 A1

(51) International Patent Classification:
*H01L 21/033* (2006.01) *C23C 16/50* (2006.01)
*H01L 21/02* (2006.01) *C23C 16/56* (2006.01)
*C23C 16/26* (2006.01)

(21) International Application Number:
PCT/US2021/028588

(22) International Filing Date:
22 April 2021 (22.04.2021)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
63/020,370 05 May 2020 (05.05.2020) US

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, 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.

WO 2021/225790 A1

(54) Title: INERT GAS IMPLANTATION FOR HARD MASK SELECTIVITY IMPROVEMENT

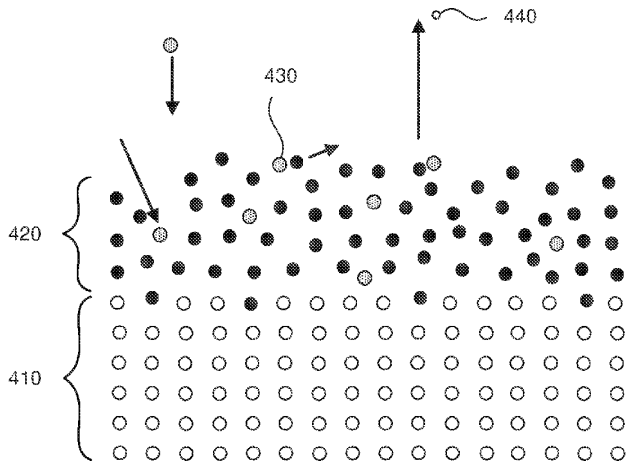



FIGURE 4

(57) Abstract: An amorphous carbon hard mask is formed having low hydrogen content and low sp3 carbon bonding but high modulus and hardness. The amorphous carbon hard mask is formed by depositing an amorphous carbon layer at a low temperature in a plasma deposition chamber and treating the amorphous carbon layer to a dual plasma-thermal treatment. The dual plasma-thermal treatment includes exposing the amorphous carbon layer to inert gas plasma for implanting an inert gas species in the amorphous carbon layer and exposing the amorphous carbon layer to a high temperature. The amorphous carbon hard mask has high etch selectivity relative to underlying materials.

*[Continued on next page]*

(84) **Designated States** *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, 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).

**Published:**

— *with international search report (Art. 21(3))*