

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
31 January 2008 (31.01.2008)

PCT

(10) International Publication Number
WO 2008/013442 A1

(51) International Patent Classification:
H01J 37/12 (2006.01) **H01J 37/063** (2006.01)

(21) International Application Number:
PCT/NL2007/000180

(22) International Filing Date: 13 July 2007 (13.07.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/833,394 25 July 2006 (25.07.2006) US
1032231 25 July 2006 (25.07.2006) NL

(71) Applicant (for all designated States except US): **MAPPER LITHOGRAPHY IP B.V.** [NL/NL]; Computerlaan 15, NL-2628 XK Delft (NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KRUIT, Pieter** [NL/NL]; Koornmarkt 49, NL-2611 EB Delft (NL). **ZHANG, Yanxia** [CN/NL]; Computerlaan 15, NL-2628 XK Delft (NL). **VAN BRUGGEN, Martijn, J.** [NL/NL]; Computerlaan 15, NL-2628 XK Delft (NL). **STEENBRINK, Stijn, Willem, Herman, Karel** [NL/NL]; Computerlaan 15, NL-2628 XK Delft (NL).

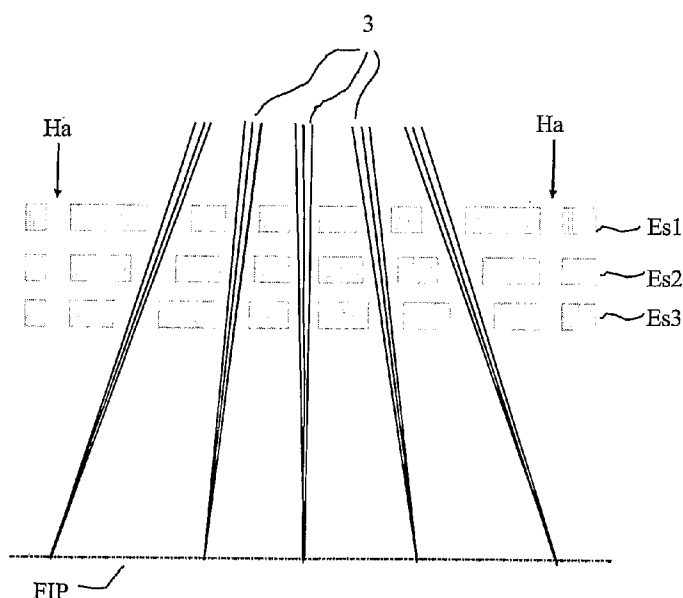
(74) Agent: **PETERS, Sebastian, Martinus**; Octrooibureau Vriesendorp & Gaade B.V., P.O. Box 266, NL-2501 AW The Hague (NL).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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

[Continued on next page]

(54) Title: A MULTIPLE BEAM CHARGED PARTICLE OPTICAL SYSTEM



(57) Abstract: The invention relates to a multiple beam charged particle optical system, comprising an electrostatic lens structure with at least one electrode, provided with apertures, wherein the effective size of a lens field effected by said electrode at a said aperture is made ultimately small. The system may comprise a diverging charged particle beam part, in which the lens structure is included. The physical dimension of the lens is made ultimately small, in particular smaller than one millimeter, more in particular less than a few tens of micrometers. In further elaboration, a lens is combined with a current limiting aperture (CLA), aligned such relative to a lens of said structure, that a virtual aperture (VA) effected by said current limiting aperture in said lens is situated in an optimum position with respect to minimizing aberrations total.

WO 2008/013442 A1



Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.