



(51) International Patent Classification:
G03F 7/20 (2006.01) **F03G 7/06** (2006.01)

(21) International Application Number:
PCT/EP2009/064605

(22) International Filing Date:
4 November 2009 (04.11.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/122,336 12 December 2008 (12.12.2008) US

(71) Applicant (for all designated States except US): **ASML NETHERLANDS B.V.** [—/NL]; De Run 6501, NL-5504 DR Veldhoven (NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DE VRIES, Gosse** [NL/NL]; Locht 77, NL-5504 KB Veldhoven (NL). **BUIS, Edwin** [NL/NL]; Leygraaf 186, NL-5951 GZ Belfeld (NL). **MICKAN, Uwe** [DE/NL]; Zevenberg 6, NL-5508 AJ Veldhoven (NL).

(74) Agent: **SLENDERS, Peter**; De Run 6504, NL-5504 DR Veldhoven (NL).

(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, BR, BW, BY, BZ, CA, CH, CL, 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, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

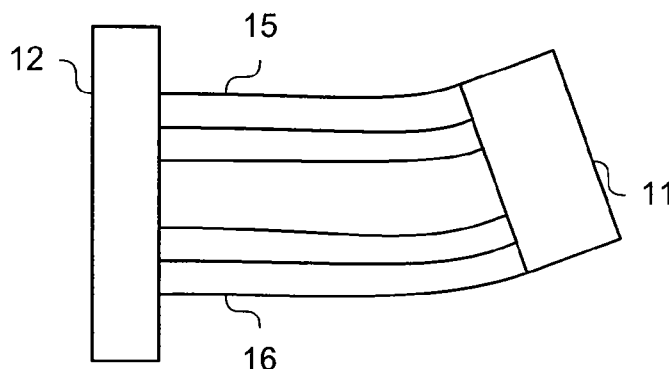
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

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

(54) Title: ACTUATOR SYSTEM, LITHOGRAPHIC APPARATUS, METHOD OF CONTROLLING THE POSITION OF A COMPONENT AND DEVICE MANUFACTURING METHOD

Fig. 2b



(57) Abstract: An actuator system is provided that is configured to move a component relative to a base of the actuator system. The actuator system includes first and second actuating elements, each comprising two sections of material that are joined to each other and have different coefficients of thermal expansion. The two actuating elements are configured such that if the temperature of one is increased it applies a force on the component in a direction that is opposite to the force applied by the other actuating element if its temperature is increased. The actuator system further includes at least one power supply configured to provide independently controllable heating to the first and second actuating elements.