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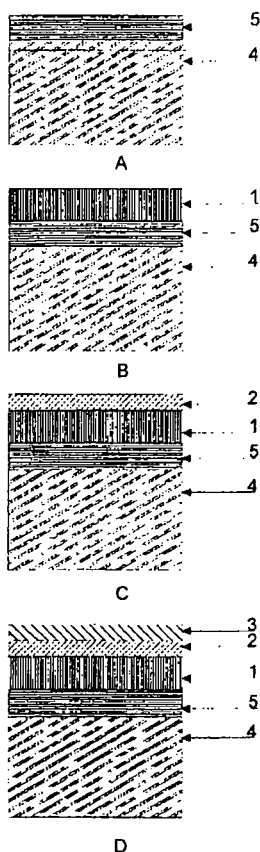
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(54) Title: DRY MULTILAYER INORGANIC ALLOY THERMAL RESIST FILM FOR LITHOGRAPHIC PROCESSING AND IMAGE CREATION



(57) Abstract: A thermal inorganic resist useful for lithographic processes and image creation is created by depositing on a substrate at least two layers of materials which are typically metals. The materials form a mixed alloy with a eutectic. One embodiment has a 15 nm Bi layer overlying a 15 nm In layer. Upon exposure to a optical light pulse of sufficient intensity, optical absorption heats the layers above the eutectic melting point (110° C for BiIn) and the resist forms an alloy in the exposed area. By selectively heating parts of the resist a desired pattern can be created in the resist. Optical characteristics of the alloyed layers are typically different from those of the unexposed layers. In BiIn resists the alloyed areas are visually transparent compared to the unexposed sections. The exposed pattern provides a viewable image useful for exposure control. In a negative resist the alloy material is resistant to development etches which remove the unexposed areas but only slowly etch the alloyed areas creating a lithographic structure. This resist structure can be used to pattern layers below it in additional etches. The resist layer can then be stripped, leaving the pattern layer on the substrate. In resists showing significant optical differences (such as BiIn) after exposure this same material can be used to create images for data storage, and, when transparent, photomasks for optical lithography.



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Declarations under Rule 4.17:

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— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations* 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, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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