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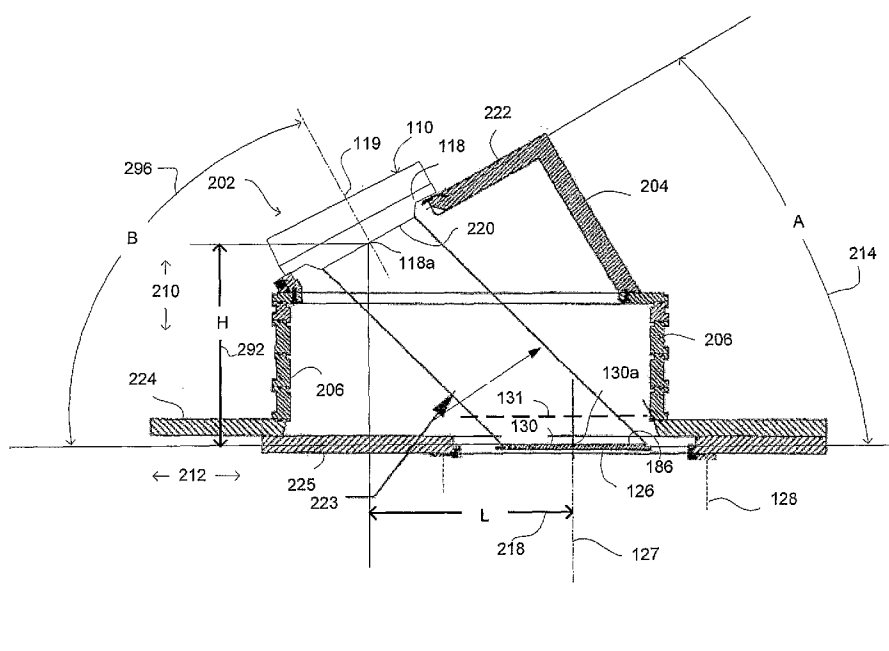
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(54) Title: PROTECTIVE OFFSET SPUTTERING



(57) Abstract: Sputtering in a physical vapor deposition (PVD) chamber (100) may, in one embodiment, utilize a target (220) laterally offset from and tilted with respect to the substrate (186). In another aspect, target power may be reduced to enhance film protection. In yet another aspect magnetron magnets may be relatively strong and well balanced to enhance film protection. In another aspect, a shutter may be provided to protect the substrate in start up conditions. Other embodiments are described and claimed.

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 U.S. : 204/192.12, 192.15, 192.15, 298.18, 298.2, 298.23, 298.28

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
 NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2002/0086220 A (NOZAWA et al) 04 July 2002 (04.07.2002), Fig. 8; Page 3 paragraph 0057; Page 5 paragraphs 0091-0094; Page 6 paragraph 0111; Page 7 paragraph 0126.	1, 4, 5, 7, 9-13, 19, 23, 26, 27, 36-43, 45, 47, 49, 51-58, 60-62
Y	US 2002/0046945 A1 (HOSOKAWA et al) 25 April 2002 (25.04.2002), Page 6 paragraph 0068.	1, 4, 5, 7, 9-13, 28, 44, 59
Y	US 6,899,795 B1 (DUBS et al) 31 May 2005 (31.05.2005), Column 3 lines 8-43, Column 8 line 59; Fig. 1; Abstract.	3, 15-18, 20, 21, 24, 25, 30-35, 46, 49, 51-58, 60-62
Y	US 6,878,243 A (BREME) 12 April 2005 (12.04.2005), Column 5 lines 38-44.	6
Y	US 6,844,119 B2 (NOZAWA et al) 18 January 2005 (18.01.2005), Column 12 lines 60-62.	50, 53

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C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,454,914 B1 (NAKAMURA) 24 September 2002 (24.09.2002), Column 6 lines 5-9, lines 41-57.	30-35, 46
Y	US 6,183,614 B1 (Fu) 06 February 2001 (06.02.2001), Column 10 lines 14-21, lines 30-33.	2, 15-18, 20, 21, 24, 25, 30-35, 46, 49, 51, 52, 54-58, 60-62
Y	US 5,180,708 (HARADA et al) 19 January 1993 (19.01.1993), Column 2 lines 32-44.	8, 22
Y	US 4,756,810 (LAMONT, JR. et al) 12 July 1988 (12.07.1988), Column 6 lines 35-39; Column 7 lines 60-64.	14, 29, 48, 63