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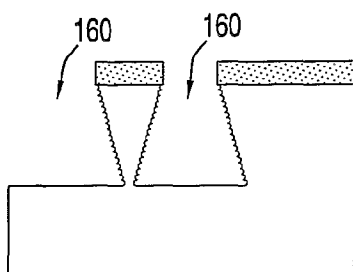
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METAL MEMS DEVICES AND METHODS OF MAKING SAME



(57) Abstract: Metal MEMS structures are fabricated from metal substrates (150), preferably titanium, utilizing micromachining processes with a new deep etching procedure to provide released microelectromechanical devices. The deep etch procedure includes metal anisotropic reactive ion etching (156) utilizing repetitive alternating steps of etching and side wall protection. Variations in the timing of the etching and protecting steps produces walls of different roughness and taper (160). The metal wafers can be macomachined before forming the MEMS structures, and the resulting wafers can be stacked and bonded in packages.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/09285

A. CLASSIFICATION OF SUBJECT MATTER

IPC: **H01L 29/84**(2006.01),**21/00**(2006.01)

USPC: 257/415;438/50

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 257/415, 416, 417, 420; 438/50, 51, 52, 53, 54, 55

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EAST: listed subs and inventor name search

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,316,979 A (MACDONALD et al) 31 May 1994 (31.05.1994), figures 1A-1F and related text.	1-18, 27, 28
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Y		19-26
A	US 5,847,454 A (SHAW et al) 08 December 1998 (08.12.1998), entire document.	1-28
A	US 6,180,536 A (CHONG et al) 30 January 2001 (30.01.2001), entire document.	1-28



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