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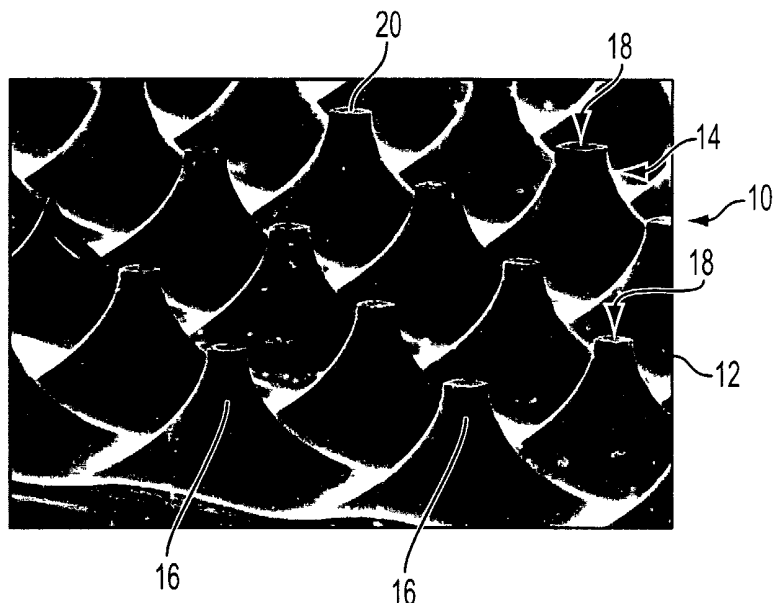
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[Continued on next page]

(54) Title: MICROPROTRUSION ARRAY AND METHODS OF MAKING A MICROPROTRUSION



(57) Abstract: A microprotrusion array is formed from a silicon wafer by a plurality of sequential plasma and wet isotropic and anisotropic etching steps. The resulting microprotrusions (14) have sharpened tips (18) or cutting edges formed by wet isotropic etching, wherein each microprotrusion has a substantially pyramid shape with each side (16) having a concave surface. The tip of each microprotrusion has a substantially flat top surface (20) extending parallel to base (12).



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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/03206

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H01L 21/302; B44C 1/22

US CL : 216/2, 11, 41, 47, 74, 79; 438/717, 719, 723, 724, 733, 739

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. : 216/2, 11, 41, 47, 74, 79; 438/717, 719, 723, 724, 733, 739

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)  
Please See Continuation Sheet

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 6,165,374 A (CATHEY et al) 26 December 2000 (26.12.2000), col.6, lines 4-col.7, line 24.	1,2,4 ----- 12-14,29-36,37
X --- Y	US 6,056,887 A (NIEDERMANN et al) 02 May 2000 (02.05.2000), col.3, lines 5-col.col.4, line 65 and figures 2A-2H.	1-9 ----- 10-11,15-28, 38-43
Y, P	US 6,334,856 A (ALLEN et al) 01 January 2002 (01.01.2002), col. 12, lines 15-54 and figures 3A-3f and 5A-5D).	12-28
A	US 5,726,073 A (ZHANG et al) 10 march 1998 (10.03.1998) see the entire document.	1-43
A	US 5,779,514 A (CHENG et al) 14 July 1998 (14.07.1998), see the entire document.	1-43
A,E	US 6,406,638 A (STOEBER et al) 18 June 2002 (18.06.2002), see the entire document.	1-43

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

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# INTERNATIONAL SEARCH REPORT

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## Continuation of B. FIELDS SEARCHED Item 3:

EAST

Search term: (micro adj machin\$3) same tip or needle