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(71) Applicant (for all designated States except US): ARIZONA BOARD OF REGENTS [US/US]; 2020 North Central Avenue, Suite 230, Phoenix, AZ 85004 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): KOZICKI, Michael, N. [US/US]; 4624 South 23rd Street, Phoenix, AZ 85048 (US).

(74) Agent: ZEMAN, Laura, J.; Snell & Wilmer, L.L.P., 400 East Van Buren, One Arizona Center, Phoenix, AZ 85004-2202 (US).

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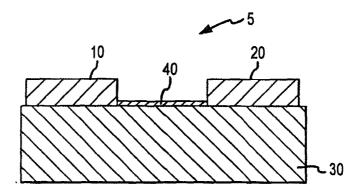
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(54) Title: PROGRAMMABLE SURFACE CONTROL DEVICES AND METHOD OF MAKING SAME



(57) Abstract: Programmable surface control devices whose physical features, such as surface characteristics and mass distribution, are controlled by the presence or absence of an electrodeposition (40) of metal and/or metal ions from a solid solution upon application of a suitable electric field between electrodes (10, 20).





INTERNATIONAL SEARCH REPORT

Inte onal Application No

		PCT/US	02/34557				
A. CLASSII IPC 7	FICATION OF SUBJECT MATTER H01L45/00 B81B1/00 G02B3/00)					
According to	o International Patent Classification (IPC) or to both national classific	ation and IPC					
<u>_</u>	SEARCHED						
Minimum do IPC 7	cumentation searched (classification system followed by classification HO1L B81B G02B B01L F16C	on symbols)					
	ion searched other than minimum documentation to the extent that s						
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data, PAJ, INSPEC, COMPENDEX							
C. DOCUME	ENTS CONSIDERED TO BE RELEVANT						
Category °	Citation of document, with indication, where appropriate, of the rel	evant passages	Relevant to claim No.				
X	WO 97 48032 A (AXON TECHNOLOGIES ARIZONA STATE UNIVERSITY) 18 December 1997 (1997-12-18)	1-6, 20-25 19,34,35					
	page 7, line 17 -page 10, line 5; page 26, line 22 -page 27, line 1 9						
	_	-/					
	ner documents are listed in the continuation of box C.	X Patent family members are lis	sted in annex.				
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filling date "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) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filling date but later than the priority date claimed		"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone 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. "&" document member of the same patent family					
	actual completion of the international search September 2003	Date of mailing of the international search report $11/09/2003$					
Name and r	mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Authorized officer Köpf, C					

INTERNATIONAL SEARCH REPORT

Inte fonal Application No
PCT/US 02/34557

	FC1/US UZ/ 3455/		
ation) DOCUMENTS CONSIDERED TO BE RELEVANT	Relevant to claim No.		
Chatton of document, with indication, where appropriate, of the relevant passages	Helevant to claim no.		
LEE J ET AL: "Addressable micro liquid handling by electric control of surface tension" TECHNICAL DIGEST MEMS 2001. 14TH IEEE INTERNATIONAL CONFERENCE ON MICRO ELECTRO MECHANICAL SYSTEMS, INTERLAKEN, SWITZERLAND, 21 - 25 January 2001, pages 499-502, XP010534657 ISBN: 0-7803-5998-4 the whole document	1,9, 11-17, 20,21, 26,28-30		
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US 6 290 859 B1 (FLEMING JAMES G ET AL) 18 September 2001 (2001-09-18) column 1, line 12 -column 3, line 40	19,34,35		
WO 95 00258 A (UNIVERSITY OF CALIFORNIA) 5 January 1995 (1995-01-05) page 3, line 21 -page 6, line 10	19,34,35		
	LEE J ET AL: "Addressable micro liquid handling by electric control of surface tension" TECHNICAL DIGEST MEMS 2001. 14TH IEEE INTERNATIONAL CONFERENCE ON MICRO ELECTRO MECHANICAL SYSTEMS, INTERLAKEN, SWITZERLAND, 21 - 25 January 2001, pages 499-502, XP010534657 ISBN: 0-7803-5998-4 the whole document US 5 992 820 A (FARE THOMAS LOUIS ET AL) 30 November 1999 (1999-11-30) column 7, line 27 -column 9, line 35; figures 4-6 WELTERS W J J ET AL: "Fast electrically switchable capillary effects" LANGMUIR, vol. 14, no. 7, 31 March 1998 (1998-03-31), pages 1535-1538, XP000980065 ISSN: 0743-7463 the whole document WO 99 18456 A (UNIVERSITE JOSEPH FOURIER; BERGE BRUNO; PESEUX JEROME) 15 April 1999 (1999-04-15) -& US 6 369 954 B1 (BERGE BRUNO ET AL) 9 April 2002 (2002-04-09) column 3, line 3 - line 39; figure 1 column 6, line 23 -column 7, line 15 US 6 290 859 B1 (FLEMING JAMES G ET AL) 18 September 2001 (2001-09-18) column 1, line 12 -column 3, line 40 WO 95 00258 A (UNIVERSITY OF CALIFORNIA) 5 January 1995 (1995-01-05)		

International application No. PCT/US 02/34557

INTERNATIONAL SEARCH REPORT

Box I	Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)					
This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:						
1.	Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:					
2.	Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:					
3.	Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).					
Box II	Observations where unity of invention is lacking (Continuation of item 2 of first sheet)					
This Inte	ernational Searching Authority found multiple inventions in this international application, as follows:					
	see additional sheet					
1.	As all required additional search fees were timely paid by the applicant, this international Search Report covers all searchable claims.					
2. X	As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.					
з	As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:					
4.	No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:					
Remark	on Protest The additional search fees were accompanied by the applicant's protest. No protest accompanied the payment of additional search fees.					

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-7, 9-18, 20-26, 28-33

Programmable surface control device/method for controlling surface tension of liquid, i.e. hydrophobic/wetting property, and method for forming such device

2. Claims: 8, 19, 27, 34, 35

Method for controlling surface friction, continually renewable metallized surface, and method for continually renewing metallized surface to compensate for wear

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte ional Application No PCT/US 02/34557

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