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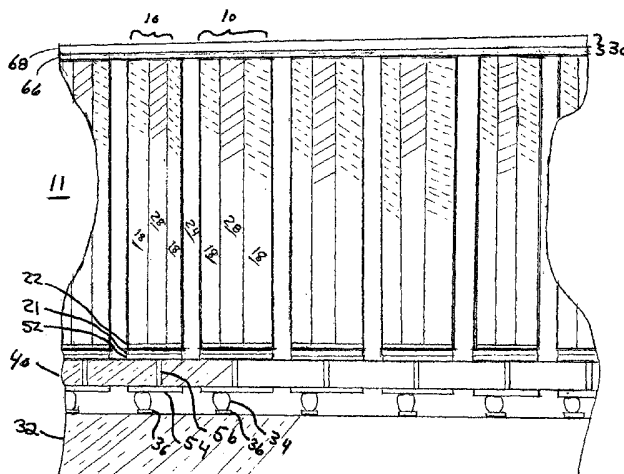
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- (74) Agents: **MAINE, Vernon** et al.; Maine & Asmus, PO Box 3445, Nashua, NH 03061-3445 (US).
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- Declaration under Rule 4.17:**
— *of inventorship (Rule 4.17(iv)) for US only*
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[Continued on next page]

(54) Title: PIEZOCOMPOSITE ULTRASOUND ARRAY AND INTEGRATED CIRCUIT ASSEMBLY



(57) Abstract: An integrated piezoelectric ultrasound array (11) structure configured to minimize the effects of differential thermal expansion between the array (11) and the integrated circuit (32) and to improve the mechanical and acoustical integrity of the array. The transducer array (11) may have an interposed thinned supporting substrate (40) and is matched to the integrated circuit substrate for thermal expansion so as to retain mechanical integrity of the array/IC bond within the working temperature range. Transducer elements (10) are laterally isolated acoustically and as to thermal expansion by air or other acoustically attenuating medium of lower elastic modulus material between the elements (10). Acoustical effects are vertically acoustically isolated with capacitive coupling and small area solder bumps (34) relative to wavelength, and further laterally acoustically isolated by thin supporting substrates relative to wavelength, including thinned semiconductor integrated circuit substrates.



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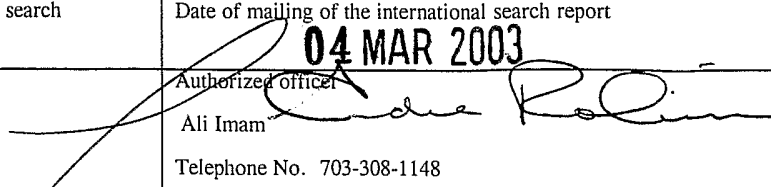


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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/18876

A. CLASSIFICATION OF SUBJECT MATTER		
IPC(7) : A61B 8/00 US CL : 600/459		
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. : 600/437, 459; 29/25.35; 367/ 7, 11, 130, 138, 140, 176; 310/327, 334; 73/ 625, 626, 642, 644		
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.
A --- X	US 5,957,851 A (Hossack) 28 September 1999 (28.09.1999), entire document, especially Figure 6.	1-22 ----- 23, 24
X	US 5,381,067 A (Greenstein et al.) 10 January 1995 (10.01.1995), Figure 2B.	23, 24
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent published on or after the international filing date	"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
"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		
"P" document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family
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Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer  Ali Imam Telephone No. 703-308-1148	

INTERNATIONAL SEARCH REPORT

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Continuation of B. FIELDS SEARCHED Item 3:

EAST

search terms: piezo, ultrasound, transducer, array, matching layer, backing layer