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(54) Title: METHOD AND SUBSYSTEM FOR PROCESSING SIGNALS UTILIZING A PLURALITY OF VIBRATING MICROMECHANICAL DEVICES

(57) Abstract: Several MEMS-based methods and architectures which utilize vibrating micromechanical resonators in circuits to implement filtering, mixing, frequency reference and amplifying functions are provided. A method and subsystem are provided for processing RF signals utilizing a plurality of vibrating micromechanical devices typically in the form of an IF mixer-filter and an RF channel selector or an image-reject RF filter. One of the primary benefits of the use of such architectures is a savings in power consumption by trading power for high selectivity (*i.e.*, high Q). Also, such methods and circuits can eliminate the need for a low noise amplifier in a receiver or transceiver subsystem. Consequently, the present invention relies on the use of a large number of micromechanical links in SSI networks to implement signal processing functions with basically zero DC power consumption.

**INTERNATIONAL SEARCH REPORT**

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7 H03H9/46				
According to International Patent Classification (IPC) or to both national classification and IPC				
<b>B. FIELDS SEARCHED</b>				
Minimum documentation searched (classification system followed by classification symbols) IPC 7 H03H				
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 practical, search terms used)  EPO-Internal				
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>				
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
A	US 5 839 062 A (NGUYEN CLARK TU-CUONG ET AL) 17 November 1998 (1998-11-17) cited in the application column 2, line 27-64 column 7, line 1-15 column 8, line 55 -column 9, line 5 ---	1,3,5,6, 8,9,15		
A	US 5 537 083 A (LIN LIWEI ET AL) 16 July 1996 (1996-07-16) cited in the application column 6, line 13-49 column 7, line 64 -column 8, line 19 ---	1,3,6,8, 9,15		
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<input type="checkbox"/> Further documents are listed in the continuation of box C.				
<input checked="" type="checkbox"/> Patent family members are listed in annex.				
° Special categories of cited documents :				
<table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none; vertical-align: top;">                     *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 filing 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 filing date but later than the priority date claimed                 </td> <td style="width:50%; border: none; vertical-align: top;">                     *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                      *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.                      *&amp;* document member of the same patent family                 </td> </tr> </table>			*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 filing 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 filing 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 *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. *&* document member of the same patent family
*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 filing 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 filing 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 *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. *&* document member of the same patent family			
Date of the actual completion of the international search  <p align="center">1 November 2001</p>		Date of mailing of the international search report  <p align="center">28/02/2002</p>		
Name and 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  <p align="center">Coppieters, C</p>		

# INTERNATIONAL SEARCH REPORT

Information on patent family members

In: International Application No  
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