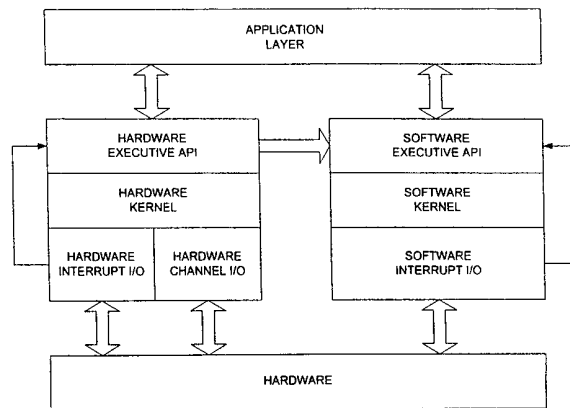




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>7</sup> : <b>G06F 9/40</b></p>	<p><b>A3</b></p>	<p>(11) International Publication Number: <b>WO 00/06084</b> (43) International Publication Date: 10 February 2000 (10.02.00)</p>
<p>(21) International Application Number: PCT/US99/17082 (22) International Filing Date: 27 July 1999 (27.07.99) (30) Priority Data: 09/127,156 31 July 1998 (31.07.98) US (71) Applicant: INTEGRATED SYSTEMS DESIGN CENTER, INC. [US/US]; 10505 Sorrento Valley Road, San Diego, CA 92121-1608 (US). (72) Inventor: BRONTE, Jeffrey, S.; 9098 Buckwheat Street, San Diego, CA 92129 (US). (74) Agent: LAND, John; Fish &amp; Richardson P.C., Suite 1400, 4225 Executive Square, La Jolla, CA 92037 (US).</p>		<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> (88) Date of publication of the international search report: 3 August 2000 (03.08.00)</p>

(54) Title: INTEGRATED HARDWARE AND SOFTWARE TASK CONTROL EXECUTIVE



(57) Abstract

A method and system for permitting a software-based executive to execute concurrently with a hardware-based executive (161). The software-based executive (166) allocates hardware executive tasks, hardware executive interrupts, software executive tasks, and software executive interrupts to defined execution spaces available on a microprocessor having a hardware-based executive (161). Applications control hardware-based executive tasks and interrupts through a hardware executive application programming interface (API, 170), and software-based executive tasks through a software executive (API, 167). Applications share the hardware executive API (170) functions for interrupt installation and management. The invention allocates all hardware executive interrupts (165) to a high priority interrupt execution space, and all hardware executive tasks to a high priority queue. All software executive interrupts are allocated to low priority interrupts. The software executive uses a special context switch mechanism (188) that changes the currently executing task without creating another low priority task. In this way, the low priority hardware scheduler (186) is always disabled, and low priority tasks are always under the control of the software executive. A hierarchical "enables" mechanism protects critical sections of code during reentrances. An interrupt return revectoring mechanism is provided to provide a mechanism for preemption. When a software executive interrupt occurs, the interrupt return revectoring mechanism (189) exits the interrupt and revectoring into the software kernel so that a new kernel task can begin executing, rather than returning to the previously executing task. A mechanism is also provided to accommodate block move operations.

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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US99/17082

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G06F 9/40  
US CL : 709/673

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. : 709/673, 709/100, 709/102, 709/107, 709/108

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
NONE

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,247,671 A [ADKINS et al] 21 September 1993, ALL	1-16
A	US 4,642,756 A [SHERROD] 10 February 1987, ALL	1-16
A	US 5,012,409 A [FLETCHER et al] 30 April 1991, ALL	1-16
A	US 4,318,173 A [FREEDMAN et al] 02 March 1982, ALL	1-16

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

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<p>Date of the actual completion of the international search</p> <p style="text-align: center;">07 FEBRUARY 2000</p>	<p>Date of mailing of the international search report</p> <p style="text-align: center; font-size: 1.2em; font-weight: bold;">25 MAY 2000</p>
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