(19) World Intellectual Property Organization

International Bureau



(43) International Publication Date 28 October 2004 (28.10.2004)

PCT

(10) International Publication Number $WO\ 2004/092968\ A3$

(51) International Patent Classification⁷: G06F 12/08

(21) International Application Number:

PCT/US2004/010895

(22) International Filing Date: 9 April 2004 (09.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 60/462,027

11 April 2003 (11.04.2003) US

(71) Applicant (for all designated States except US): SUN MI-CROSYSTEMS, INC. [US/US]; 4150 Network Circle, Santa Clara, CA 95054 (US).

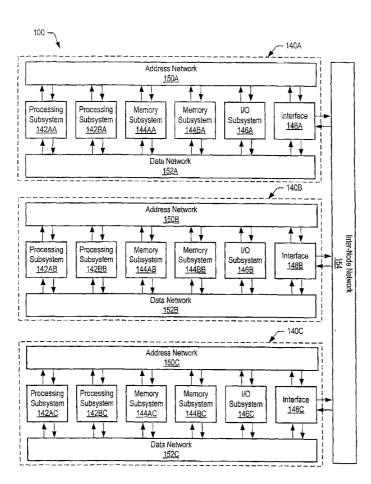
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): CYPHER, Robert, E. [US/US]; 18460 Montpere Way, Saratoga, CA 95070

(US). LANDIN, Anders [SE/US]; 546 Dartmouth Avenue, San Carlos, CA 94070 (US). HAGERSTEN, Erik, E. [SE/SE]; Dobelnsg 17, S-752 37 Uppsala (SE).

- (74) Agent: MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.; Attn: Kivlin, B. Noel, P.O. Box 398, Austin, TX 78767-0398 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, 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, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: MULTI-NODE SYSTEM WITH GLOBAL ACCESS STATES



(57) Abstract: A system may include several nodes coupled by an inter-node network configured to convey coherency messages between the nodes. Each node may include several active devices coupled by an address network and a data network. The nodes implement a coherency protocol such that if an active device in one of the nodes has an ownership responsibility for a coherency unit, no active device in any of the other nodes has a valid access right to the coherency unit. For example, if a node receives a coherency message requesting read access to a coherency unit from another node, the node may respond by conveying a proxy address packet, receipt of which removes ownership, on the node's address network to an owning active device. In contrast, the active device's ownership responsibility may not be removed in response to a device within the same node requesting read access to the coherency unit.

WO 2004/092968 A3



GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

with international search report

- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 9 December 2004

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

onal Application No Pt., US2004/010895

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 G06F12/08

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) $IPC\ 7\ G06F$

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, COMPENDEX, INSPEC, PAJ, IBM-TDB, WPI Data

ategory °	Citation of document, with indication, where appropriate, of the	Relevant to claim No.	
(US 2002/124144 A1 (RAVISHANKAR AL) 5 September 2002 (2002-09- paragraph '0137! - paragraph ' figures 1,11	-05)	1-5
1	paragraph '0159! - paragraph '	0169!	6-30
Y	EP 1 255 201 A (SUN MICROSYSTE 6 November 2002 (2002-11-06) paragraph '0050! - paragraph ' paragraph '0014! - paragraph ' figures 1-8	0054!	6-30
A	paragraph '0055!; figure 9		1-5
A	EP 0 817 073 A (SUN MICROSYSTE 7 January 1998 (1998-01-07) column 25, line 24 - column 29		1-30
X Furt	ther documents are listed in the continuation of box C.	X Patent family member	s are listed in annex.
"A" docum consider filing a cour which citatic "O" docum other "P" docum	ent defining the general state of the art which is not dered to be of particular relevance document but published on or after the international date ent which may throw doubts on priority claim(s) or is cited to establish the publication date of another on or other special reason (as specified) nent referring to an oral disclosure, use, exhibition or means ent published prior to the international filling date but than the priority date claimed	or priority date and not in cited to understand the pr invention "X" document of particular rele cannot be considered not involve an inventive step: "Y" document of particular rele cannot be considered to i document is combined with the considered to it document is combined with the cited to it document in	yel or cannot be considered to when the document is taken alone syance; the claimed invention involve an inventive step when the ith one or more other such docubeing obvious to a person skilled
Date of the	actual completion of the international search	Date of mailing of the inter	mational search report
2	21 October 2004	04/11/2004	
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,	Authorized officer	ertpfund K

INTERNATIONAL SEARCH REPORT

Int al Application No
Pulus 2004/010895

0.00==1	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	1017 0320047 010033		
C.(Continu		Relevant to claim No.		
<u>.</u>		1-30		
Α	US 6 457 100 B1 (GOLDRIAN GOTTFRIED ANDREAS ET AL) 24 September 2002 (2002-09-24) column 19, line 4 - column 22, line 63; figures 4,5	1-30		
A	US 5 335 335 A (JACKSON MIKE T ET AL) 2 August 1994 (1994-08-02) column 3, line 23 - column 4, line 51	15		

INTERNATIONAL SEARCH REPORT

al Application No

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 2002124144	A1	05-09-2002	US	2002007443 A1	17-01-2002
			US	2002129208 A1	12-09-2002
			US	2002083274 A1	27-06-2002
			US	2002087806 A1	04-07-2002
			US	2002087807 A1	04-07-2002
			US	2003023814 A1	30-01-2003
			US	2004064653 A1	01-04-2004
			บร	2004088487 A1	06-05-2004
			US	2002010836 A1	24-01-2002
			US	2002046324 A1	18-04-2002
			US	2002046327 A1	18-04-2002
			US	2002010840 A1	24-01-2002
			US 	2002007439 A1	17-01-2002
EP 1255201	Α	06-11-2002	EP	1255201 A1	06-11-2002
			US	2003018739 A1	23-01-2003
			US	2004002992 A1	01-01-2004
EP 0817073	Α	07-01-1998	US	5749095 A	05-05-1998
			DE	69721643 D1	12-06-2003
			DE	69721643 T2	26-02-2004
			EP	0817073 A2	07-01-1998
			JP	10143482 A	29-05-1998
US 6457100	B1	24-09-2002	JP	2001147903 A	29-05-2001
US 5335335	Α	02-08-1994	NONE		