(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
23 May 2002 (23.05.2002)

PCT

(10) International Publication Number
WO 02/041143 A3

(51) International Patent Classification[7]: G06F 9/44, 9/45

(21) International Application Number: PCT/CA01/01621

(22) International Filing Date:
19 November 2001 (19.11.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/252,170	20 November 2000 (20.11.2000)	US
60/276,375	16 March 2001 (16.03.2001)	US
09/956,130	20 September 2001 (20.09.2001)	US

(71) Applicant *(for all designated States except US)*: **ZUCOTTO WIRELESS INC.** [US/US]; Suite 400, 4225 Executive Square, La Jolla, CA 92037 (US).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **BOTTOMLEY, Mark** [CA/CA]; 803 Foxwood Court, Orleans, Ontario K4A 3E9 (CA).

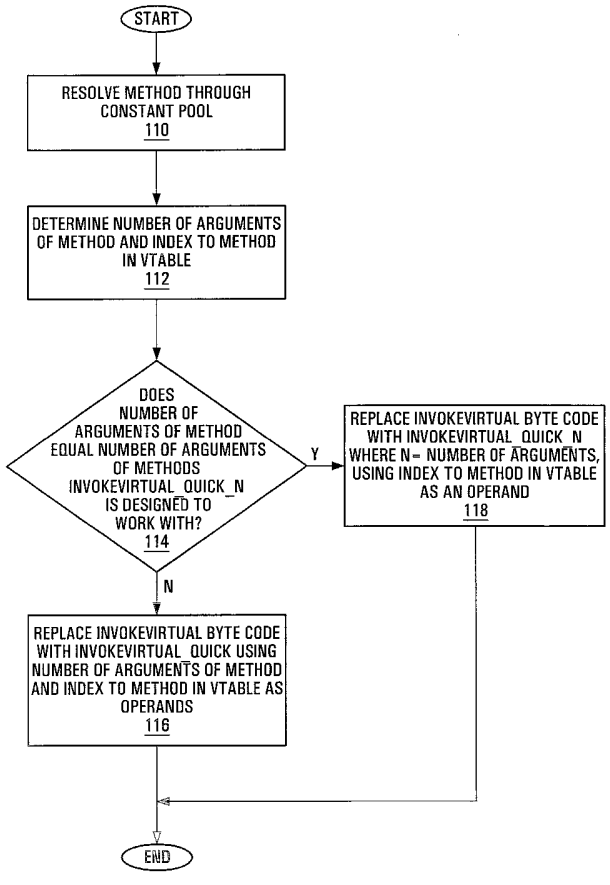
(74) Agents: **BRETT, R., Allan** et al.; Smart & Biggar, P.O. Box 2999, Station D, 900-55 Metcalfe Street, Ottawa, Ontario K1P 5Y6 (CA).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, 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, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: METHOD OF BYTE CODE QUICKENING



(57) Abstract: A method of method invocation quickening is provided. Standard Java and Java-like applications use a relatively small number of static methods in comparison to the number of classes required, and the associated methods use a relatively small number of arguments in comparison to the number of virtual methods of a class. Known method invocation quickening instructions use operands which specify indices to locate classes, virtual methods, static methods, and specify numbers of arguments of virtual methods. Current allocation of bit-length to operands are inefficient due to the lack of correspondence with the relative sizes of numbers of items indexed or represented by the operands. The herein invention discloses a system and a method to more efficiently allocate the number of bits used in quickened invocation of virtual and static methods by allocating fewer bits to those operands which index items of a relative small number, and allocate more bits to those operands which index items having relatively larger numbers.

WO 02/041143 A3

European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

(88) Date of publication of the international search report:
20 November 2003

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/CA 01/01621

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06F9/44 G06F9/45 .

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 009 273 A (AYERS ANDREW E ET AL) 28 December 1999 (1999-12-28) column 2, line 64 -column 3, line 22 column 8, line 35 -column 11, line 37	1-81
A	WEISS M ET AL: "TURBOJ, A JAVA BYTECODE-TO-NATIVE COMPILER" LECTURE NOTES IN COMPUTER SCIENCE, SPRINGER VERLAG, NEW YORK, NY, US, no. 1474, 1998, pages 119-130, XP000972740 ISSN: 0302-9743 paragraph '03.2!	1-81

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"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	Date of mailing of the international search report
4 July 2003	22/07/2003

Name and mailing address of the ISA	Authorized officer
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	Bijn, K

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int[redacted]tional Application No
PCT/CA 01/01621

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6009273 A	28-12-1999	NONE	