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(81) Designated States (unless otherwise indicated, for every kind of national protection available):

AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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(54) Title: SYSTEM AND METHODS FOR GENERATING AND MANAGING A VIRTUAL DEVICE

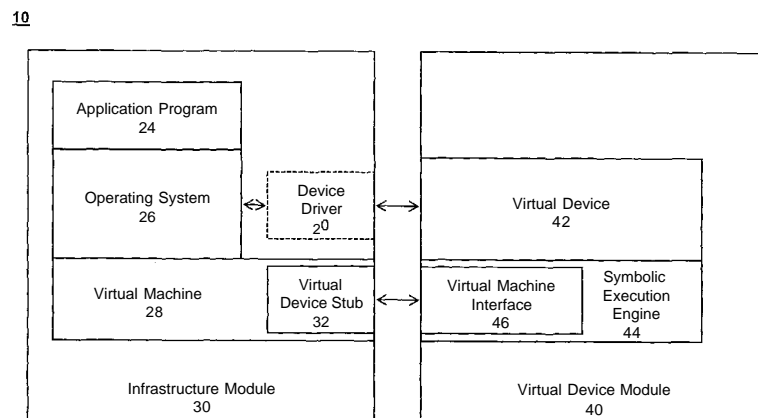


FIG. 3A

(57) Abstract: Certain embodiments of the present invention are configured to permit development and validation of a device driver or a device application program by using improved virtual devices. Such improved virtual devices facilitate driver development without use of real devices or hardware prototypes. The present invention also may be configured to permit advanced validation of a device-driver combination that would be difficult to achieve even with a real device. Certain embodiments also may detect inconsistencies between virtual and real devices, which may be used to improve drivers and device application programs and increase compatibility of such drivers and device application programs with real devices.

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## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/IB2012/002183****A. CLASSIFICATION OF SUBJECT MATTER***G06F 13/14(2006.01); G06F 9/44(2006.01)I, G06F 11/36(2006.01)I*

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)

G06F 13/14; G06F 3/00; G06F 17/30; G06F 9/46; G06F 9/455; G06F 15/177; G06F 21/00; G06F 17/40

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) &amp; Keywords: device driver, virtual machine, symbolic and similar terms.

**c. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2007-0074226 A1 (VINCENT J. ZIMMER et al.) 29 March 2007 See paragraphs 14-22; and figure 2.	1-20
A	US 7840790 B1 (VISHNU MOHAN SEKHAR et al.) 23 November 2010 See column 6, line 35 - column 10, line 10; and figure 1B.	1-20
A	WO 2011-072340 A1 (NATIONAL ICT AUSTRALIA LIMITED) 23 June 2011 See page 18, line 24 - page 19, line 12; and figure 2.	1-20
A	US 7941813 B1 (STANISLAV S. PROTASSOV et al.) 10 May 2011 See column 4, line 53 - column 6, line 16; and figure 1B.	1-20
A	US 2009-0113422 A1 (TOSHIMITSU KANI) 30 April 2009 See paragraphs 29-30; and figure 3B.	1-20

 Further documents are listed in the continuation of Box C. 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

"E" earlier application or patent but published on or after the international filing date

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"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

"&amp;" document member of the same patent family

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/IB2012/002183**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007-0074226 A1	29.03.2007	None	
US 7840790 B1	23.11.2010	None	
W0 2011-072340 A1	23.06.2011	AU 2012-3337 16 A1 EP 2513821 A1	26.07.2012 24.10.2012
US 7941813 B1	10.05.2011	US 8171504 B1 US 8312478 B1	01.05.2012 13.11.2012
US 2009-01 13422 A1	30.04.2009	CN 101425022 A EP 2056199 A2 JP 2009-1 10518 A US 8281303 B2	06.05.2009 06.05.2009 21.05.2009 02.10.2012