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Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR MONITORING INTERRUPTS DURING A POWER DOWN EVENT AT A PROCESSOR

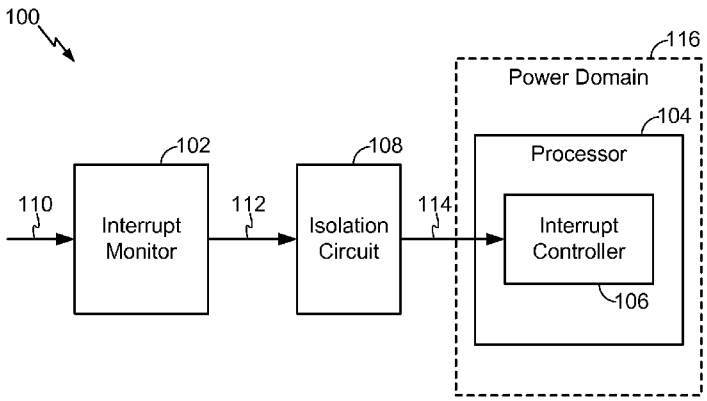

FIG. 1

(57) Abstract: In a particular embodiment, a method of monitoring interrupts during a power down event at a processor includes activating an interrupt monitor to detect interrupts. The method also includes isolating an interrupt controller of the processor from the interrupt monitor, where the interrupt controller shares a power domain with the processor. The method also includes detecting interrupts at the interrupt monitor during a power down time period associated with the power down event.

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F1/32 G06F13/24
ADD.

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

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 926 640 A (MASON ANDREW HALSTEAD [US] ET AL) 20 July 1999 (1999-07-20)	1-4,6-12
Y	column 2, line 65 - page 9, line 42; figures 1-6	5,15,16, 18-20
X	GB 2 463 800 A (INTEL CORP [US]) 31 March 2010 (2010-03-31)	1-4,6-12
Y	page 2, line 15 - page 9, line 6; figures 1-4	5,15,16, 18-20
X	US 5 551 044 A (SHAH NILESH V [US] ET AL) 27 August 1996 (1996-08-27)	14,17
Y	column 1, line 45 - column 16, line 9; figures 1-17	15,16, 18-20
X	US 2009/164817 A1 (AXFORD SIMON [GB] ET AL) 25 June 2009 (2009-06-25)	1
A	the whole document	2-4

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[X] Further documents are listed in the continuation of Box C.

[X] 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 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

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"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
14 February 2012	01/03/2012

Name and mailing address of the ISA/	Authorized officer
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Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2007/260794 A1 (ASHISH MATHUR [IN] ET AL) 8 November 2007 (2007-11-08) the whole document	5
A	US 2006/053326 A1 (NAVEH ALON [IL] ET AL) 9 March 2006 (2006-03-09) the whole document	1-4
A	EP 0 884 684 A1 (ALSTHOM CGE ALCATEL [FR] CIT ALCATEL [FR]) 16 December 1998 (1998-12-16) the whole document	1-4
A	US 4 159 516 A (HERION W S [US] ET AL) 26 June 1979 (1979-06-26) the whole document	1-4
A	US 2008/209233 A1 (KUMAR BHOODEV [US] ET AL) 28 August 2008 (2008-08-28) the whole document	6-12
A	US 2002/161961 A1 (HARDIN DAVID S [US] ET AL) 31 October 2002 (2002-10-31) the whole document	1-20

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/048661

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-4

   A method of monitoring interrupts during a power down event at a processor, the method comprising: selectively determining whether a particular interrupt is replayed.

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2. claim: 5

   A method of monitoring interrupts during a power down event at a processor, wherein at least one of theinterrupts is an edge triggered interrupt

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3. claims: 6-13

   A method of monitoring interrupts during a power down event at a processor, the method comprising:clearing any prior interrupt stored at the interrupt monitor.

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4. claims: 14-20

   Apparatus comprising an interrupt monitor comprising a first multiplexer to selectively provide incoming interrupts to the interrupt detection circuit during a power down time period associated with a power down event; a second multiplexer to selectively isolate the interrupt controller from the interrupt monitor.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2011/048661

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