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(71) Applicant (for all designated States except US): **INTEL CORPORATION** [US/US]; 2200 Mission College Boulevard, Santa Clara, CA 95052 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ROTEM, Efraim** [IL/IL]; 8 Viso St., 34400 Haifa (IL). **LAMDEN, Oren** [IL/IL]; 12 Shoshanim St., 36056 Kiryat Tivon (IL). **NAVEH, Alon** [IL/IL]; 97 Usishkin St., 47204 Ramat Hasharon (IL).

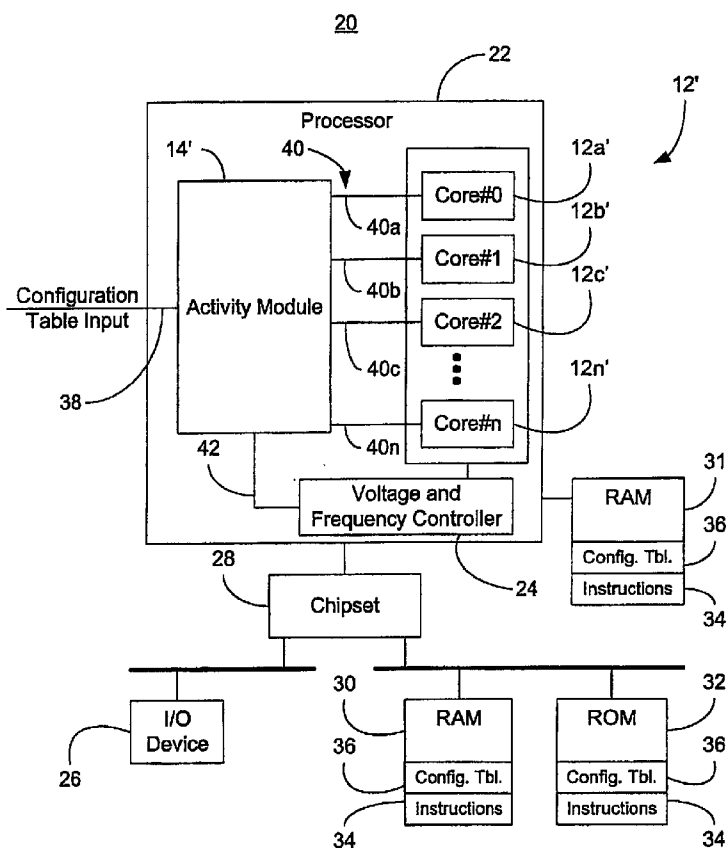
(74) Agents: **VINCENT, Lester, J.** et al.; Blakely, Sokoloff, Taylor & Zafman LLP, 12400 Wilshire Boulevard, 7th Floor, Los Angeles, CA 90025 (US).

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[Continued on next page]

(54) Title: OPERATING POINT MANAGEMENT IN MULTI-CORE ARCHITECTURES



(57) Abstract: Systems and methods of managing operating points provide for determining the number of active cores in a plurality of processor cores. A maximum operating point is selected for at least one of the active cores based on the number of active cores. In one embodiment, the number of active cores is determined by monitoring an ACPI processor power state signal of each of the plurality of cores.



RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA,
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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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/US2005/046847

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F1/20

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, PAJ, 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 2004/117678 A1 (SOLTIS DONALD C ET AL) 17 June 2004 (2004-06-17) paragraph [0020] - paragraph [0049]; figures 1-3	1-9, 12-29
X	US 2003/110012 A1 (ORENSTIEN DORON ET AL) 12 June 2003 (2003-06-12) paragraph [0035] - paragraph [0041]; figures 2,6,7	1-9, 12-29
X	PATENT ABSTRACTS OF JAPAN vol. 1997, no. 08, 29 August 1997 (1997-08-29) -& JP 09 097122 A (TOSHIBA CORP), 8 April 1997 (1997-04-08) abstract	1-9, 12-29
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☒ 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 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

21 June 2006

Date of mailing of the international search report

29/06/2006

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,
Fax: (+31-70) 340-3016

Authorized officer

Vertua, A

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2005/046847

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 2005/124550 A (SONY COMPUTER ENTERTAINMENT INC; ADACHI, KENICHI; YAZAWA, KAZUAKI; TAK) 29 December 2005 (2005-12-29) the whole document -----	1-9, 12, 13, 15, 18-22
X	US 5 790 817 A (ASGHAR ET AL) 4 August 1998 (1998-08-04) column 7, line 38 - column 10, line 67; figures 3,4 -----	1-9, 12-29
X	US 2002/095610 A1 (NUNOMURA YASUHIRO) 18 July 2002 (2002-07-18) paragraph [0046]; figures 2-4 -----	1-9, 12-29
X	US 2004/215986 A1 (SHAKKARWAR RAJESH G) 28 October 2004 (2004-10-28) paragraph [0015] - paragraph [0050]; figures 1-4 -----	1-9, 12-29

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2005/046847

Box 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.: 10,11
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:
see FURTHER INFORMATION sheet PCT/ISA/210
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 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:

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 fee, this Authority did not invite payment of any additional fee.
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.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 10,11

Claims 10,11 are vague and not supported by the description (Art. 6 PCT). It is unclear how the performance level is determined and how the selecting is based on the performance levels. The example of the description (par. 18), does not allow to clarify the claim.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2005/046847

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004117678 A1	17-06-2004	NONE	
US 2003110012 A1	12-06-2003	US 2005050373 A1	03-03-2005
JP 09097122 A	08-04-1997	JP 3466793 B2	17-11-2003
WO 2005124550 A	29-12-2005	JP 2006011548 A	12-01-2006
US 5790817 A	04-08-1998	DE 69733314 D1	23-06-2005
		DE 69733314 T2	16-03-2006
		EP 0928550 A1	14-07-1999
		JP 2001501791 T	06-02-2001
		WO 9814023 A1	02-04-1998
US 2002095610 A1	18-07-2002	JP 2002215599 A	02-08-2002
US 2004215986 A1	28-10-2004	NONE	