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Declarations under Rule 4.17:

[Continued on next page]

(54) Title: QUERY OPTIMIZER WITH SCHEMA CONVERSION

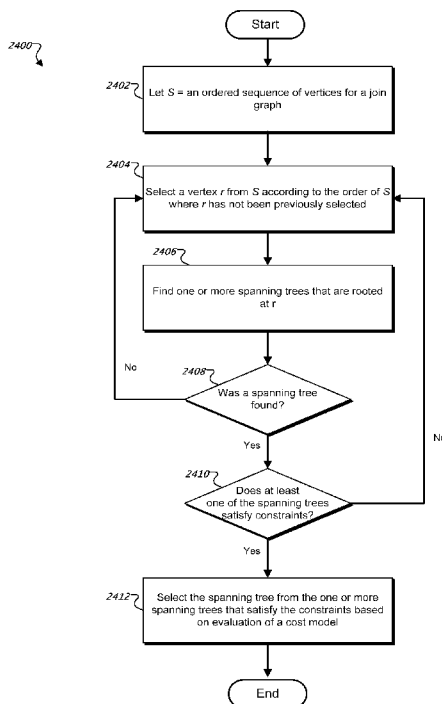


FIG. 24

(57) Abstract: Methods, program products and systems for determining, for a database query that does not represent a snowflake schema, a graph comprising vertices each representing a table joined in the query, a directed edge between each pair of vertices of which a first vertex represents a first table and a second vertex represents a second table that is joined in the query with the first table, each of the edges representing one of an outer join and an inner join. Further determining, for the graph, a directed spanning tree that represents an ordering of joins in the query and includes all outer join edges in the graph.

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

Published:

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

(88) Date of publication of the international search report:
30 September 2010

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2010/023216

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F17/30
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, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2008/033914 A1 (CHERNIACK MITCH [US] ET AL) 7 February 2008 (2008-02-07) the whole document	1-28
A	MIKE STONEBRAKER ET AL: "C-Store: A Column-oriented DBMS" INTERNET CITATION 2005, XP002477910 Retrieved from the Internet: URL:http://www.mit.edu/{dna/vldb.pdf [retrieved on 2008-04-23] section 8.2 * abstract	1-28
A	US 5 345 585 A (IYER BALAKRISHNA R [US] ET AL) 6 September 1994 (1994-09-06) * abstract column 7, line 59 - column 8, line 20	1-28

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

28 July 2010

Date of mailing of the international search report

03/08/2010

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2010/023216

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	STEINBRUNN M ET AL: "HEURISTIC AND RANDOMIZED OPTIMIZATION FOR THE JOIN ORDERING PROBLEM" VLDB JOURNAL, SPRINGER VERLAG, BERLIN, DE LNKD- DOI:10.1007/S007780050040, vol. 6, no. 3, 1 August 1997 (1997-08-01), pages 191-208, XP000957755 ISSN: 1066-8888 the whole document -----	1-28
A	US 6 105 020 A (LINDSAY BRUCE GILBERT [US] ET AL) 15 August 2000 (2000-08-15) claims; figures -----	1-28

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/023216

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.: 1-28(partially)
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 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:

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

Continuation of Box II.2

Claims Nos.: 1-28(partially)

Present claims 1, 11, 20 relate to a method/program product/system which has a given desired property or effect, namely the "spanning tree being a sufficient basis for a physical plan to obtain data records that satisfy the query". However, the description does not provide support and disclosure in the sense of Article 6 and 5 PCT for any such method/program product/system having the said property or effect and there is no common general knowledge of this kind available to the person skilled in the art. This non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search of the claim (PCT Guidelines 9.19 and 9.20). The search of claims 1-28 was consequently restricted to the specifically disclosed method/program product/system having the desired property or effect, see description page 29, line 6 - page 34, line 14.

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, 8.2), 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/US2010/023216

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
US 2008033914	A1	07-02-2008	EP 2052317 A2	29-04-2009
			WO 2008016878 A2	07-02-2008
US 5345585	A	06-09-1994	JP 2503171 B2	05-06-1996
			JP 5233721 A	10-09-1993
US 6105020	A	15-08-2000	NONE	