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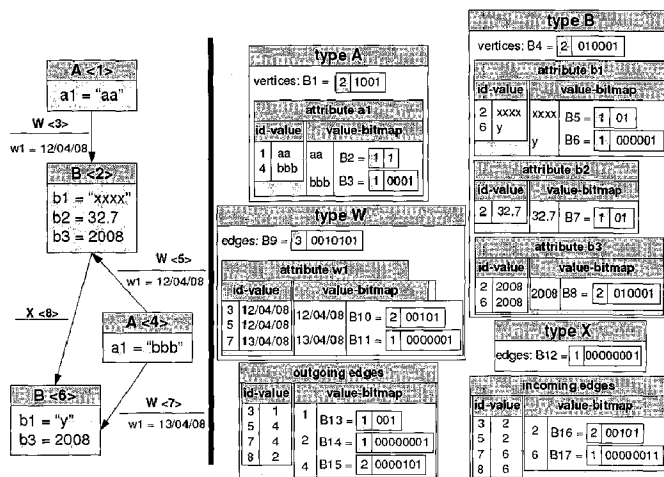
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(54) Title: PROCESS FOR REPRESENTING AND HANDLING MULTIGRAPHS BASED ON THE USE OF BITMAPS



(57) Abstract: The present invention establishes a process for, given a logical representation of data in network or multigraph form, creating a set of structures which allow the efficient storage thereof in a digital system and the subsequent handling thereof. The multigraph is represented using bitmaps with element counters and mappings between values and organized bitmaps for the purpose of facilitating the handling of said multigraphs. The bits in the bitmaps represent two essential aspects of the multigraph: 1) indexing of all the objects of the multigraph as a function of their identifiers and 2) connectivity between objects of the multigraph, whether they are vertices or edges. Mappings allow, given a value, accessing the objects of the multigraph which contain such value. Multigraph operations are solved by accessing the mappings and applying logical operations on the bitmaps. This way of representing a graph allows efficiently performing graph operations such as: inserting a vertex or an edge, inserting an attribute, acquiring the incoming and outgoing edges of an attribute, etc.

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B. FIELDS SEARCHED  
Minimum documentation searched (classification system followed by classification symbols)  
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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.
X	MARTINEZ-BAZAN N ET AL: "DEX: High-performance exploration on large graphs for information retrieval", PROCEEDINGS OF THE ACM SIXTEENTH CONFERENCE ON INFORMATION AND KNOWLEDGE MANAGEMENT (CIKM 2007), 6-9 NOVEMBER 2007, LISBOA, PORTUGAL, November 2007 (2007-11), pages 573-582, XP002617246, * section 1 * * section 2: introduction, 2.1 and 2.4; table 2 * * section 3.1 * ----- -/--	1-9

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	"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
"E" earlier document but published on or after the international filing date	"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
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"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PÖIAL J: "Implementation of directed multigraphs in Java", PROCEEDINGS OF THE 2ND INTERNATIONAL SYMPOSIUM ON PRINCIPLES AND PRACTICE OF PROGRAMMING IN JAVA (PPPJ 2003), 16-18 JUNE 2003, KILKENNY CITY, IRELAND, June 2003 (2003-06), page 163, XP002617247, * the whole document *	1-9
A	GOMEZ-VILLAMOR S ET AL: "BIBEX: a bibliographical exploration tool based on the DEX graph query engine", PROCEEDINGS OF THE 11TH INTERNATIONAL CONFERENCE ON EXTENDING DATABASE TECHNOLOGY (EDBT'08), 25-30 MARCH 2008, NANTES, FRANCE, March 2008 (2008-03), pages 735-739, XP002617248, * sections 1 and 4 *	1-9
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T	ALVAREZ S ET AL: "A compact representation of graph databases", PROCEEDINGS OF THE EIGHTH WORKSHOP MINING AND LEARNING WITH GRAPHS (MLG 2010), 24-25 JULY 2010, WASHINGTON, DC, USA, July 2010 (2010-07), pages 18-25, XP002617251, * sections 1 and 2 *	
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