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[Continued on next page]

(54) **Title:** SPECTRAL CLUSTERING FOR MULTI-TYPE RELATIONAL DATA

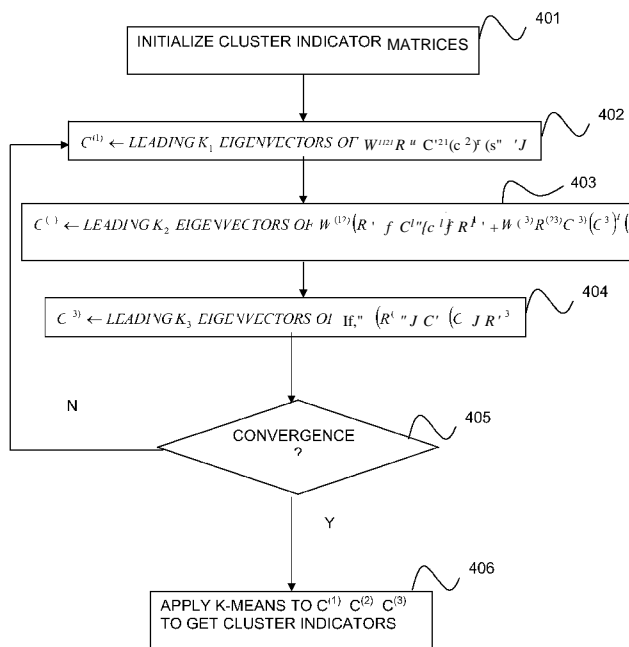


FIG 4

(57) **Abstract:** A general model is provided which provides collective factorization on related matrices, for multi-type relational data clustering. The model is applicable to relational data with various structures. Under this model, a spectral relational clustering algorithm is provided to cluster multiple types of interrelated data objects simultaneously. The algorithm iteratively embeds each type of data objects into low dimensional spaces and benefits from the interactions among the hidden structures of different types of data objects.

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A. CLASSIFICATION OF SUBJECT MATTER*G06F 7/36(2006.01)1, G06F 7/24(2006.01)1, G06F 17/30(2006.01)1*

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)

IPC G06F (2009 01)

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 since 1975

Japanese Utility models and application for Utility models since 1975

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

e-KIPASS(KIPO internal) "spectral", "cluster", "relational data", "algorithm", "multi-type"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category's*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X	Bo Long et al , "Spectral Clustering for Multi-type Relational Data",	1-56
Y	In proceedings of the 23th International Conference on Machine Learning, 585-592, Pittsburgh, PA, USA (ICML2006) http //www cs binghamton edu/~blong/pubhcations/icml06 pdf	57
Y	US 2004-0267686 A1 (CHAYES et al) 30 December 2004	57
A	See the abstract, [0044]-[0057] of specifications, and figures 1-4, 17	1-56
A	EP 01724703 A1 (SIEMENS AKTIENGESELLSCHAFT) 22 November 2006 See the abstract, [0037]-[0047] of specifications, and figure 6	1-57
A	US 2003-0018620 A1 (VISHNUBHOTLA) 23 January 2003 See the abstract, [0040]-[0053] of specifications, and figures 1-lb	1-57

 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

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"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

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US 2004-0267686 A 1	30.12.2004	NONE	
EP 01724703 A 1	22.11.2006	NONE	
US 2003-0018620 A 1	23.01.2003	US 6718338 B2	06.04.2004