(19) World Intellectual Property Organization International Bureau





(43) International Publication Date 24 August 2000 (24.08.2000)

(10) International Publication Number WO 00/49517 A3

(51) International Patent Classification7: 17/27, 15/00

G06F 17/10,

(21) International Application Number: PCT/US00/04118

(22) International Filing Date: 18 February 2000 (18.02.2000)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 19 February 1999 (19.02.1999) 60/120,659

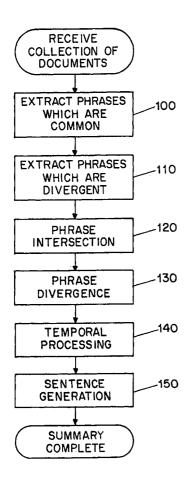
(71) Applicant (for all designated States except US): THE TRUSTEES OF COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK [US/US]; 116th Street and Broadway, New York, NY 10027 (US).

(72) Inventors; and

- (75) Inventors/Applicants (for US only): MCKEOWN, Kathleen, R. [US/US]; 20 Prospect Road, Wayne, NJ 07470 (US). BARZILAY, Regina [US/US]; 548 Riverside Drive, Apt. 4B, New York, NY 10027 (US).
- (74) Agents: TANG, Henry et al.; Baker Botts, LLP, 30 Rockefeller Plaza, New York, NY 10112-0228 (US).
- (81) Designated States (national): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent

[Continued on next page]

(54) Title: MULTI-DOCUMENT SUMMARIZATION SYSTEM AND METHOD



(57) Abstract: A summary for a collection of related documents can be generated by extracting phrases (100) from the documents which include common focus elements. Phrase intersection analysis (120) is then performed on the extracted phrases (100) to generate a phrase intersection table, where identical or equivalent phrases are identified. Temporal processing (140) on the phrases in the phrase intersection table is performed to remove ambiguous time references and to sort the phrases in a temporal sequence. Sentence generation is then used to combine the phrases in the phrase intersection table into a coherent summary.

WO 00/49517 A3

WO 00/49517 A3



(AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

With international search report.

(88) Date of publication of the international search report: 30 November 2000

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/US00/04118

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) :GO6F 17/10, 17/27, 15/00 US CL : 704/1, 9, 10; 707/530, 531, 532					
	to International Patent Classification (IPC) or to both	mational classification and IPC			
	DS SEARCHED locumentation searched (classification system follower	d by classification symbols)			
	704/1, 9, 10; 707/530, 531, 532	- oy vassusvason symbols;			
Doouments	tion searched other than minimum documentation to the	extent that such documents are included	in the fields searched		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched					
Electronic o	data base consulted during the international search (na	ume of data base and, where practicable	e, search terms used)		
Please See Extra Sheet.					
C. DOCUMENTS CONSIDERED TO BE RELEVANT					
Category*	Citation of document, with indication, where appropriate, of the relevant passages		Relevant to claim No		
A,P	US 5,924,108 A (FEIN ET AL) 13 JULY 1999, ABSTRACT.		1-22		
- A	US 5,638,543 A (PEDERSEN ET AL) 10 JUNE 1997.		1-22		
Y	US 5,077,668 A (DOI) 31 DECEMBER 1991, ABSTRACT.		1, 8 AND 16		
- A	US 5,848,191 A (CHEN ET AL) 08 DECEMBER 1998		1-22		
A	US 4,965,763 A (ZAMORA) 23 OCTOBER 1990.		1-22		
Y	US 5,838,323 A (ROSE ET AL) 17 NOVEMBER 1998, ABSTRACT.		1, 8 AND 16		
A	US 5,297,027 A (MORIMOTO ET AL) 22 MARCH 1994.		1-22		
X Further documents are listed in the continuation of Box C. See patent family annex.					
Special categories of cited documents: "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					
to be of particular relevance "B" earlier document published on or after the international filing date "X" document of particular relevance; the claimed invention can considered novel or cannot be considered to involve an invention					
*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 associated to establish the publication of the cited to establish the publication date of another citation or other special reason (as associated to establish the publication of the cited to establish the publication date of another citation or other special reason (as as as a cited to establish the publication date of another citation or other special reason (as as a cited to establish the publication date of another citation or other special reason (as a cited to establish the publication date of another citation or other special reason (as a cited to establish the publication date of another citation or other special reason (as a cited to establish the cited to establish the publication date of another citation or other special reason (as a cited to establish the cited					
special reason (as specified) "O" document or particular relevance; the claimed invention can considered to involve an inventive step when the docum combined with one or more other such documents, such combin means "O" document or particular relevance; the claimed invention can considered to involve an inventive step when the docum combined with one or more other such documents, such combin being obvious to a person skilled in the art			step when the document is h documents, such combination		
	• • •				
Date of the actual completion of the international search O3 JULY 2000 Date of mailing of the international search O3 JULY 2000					
		Authorized officer	71.41		
Box PCT Washington, D.C. 20231		Patrick N. Edouard	HUU		
Feerimile No. (703) 305-3230		Telephone No. (703) 308-6725			

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/04118

C (Continua	tion). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages		Relevant to claim No
Y	US 5,689,716 A (CHEN ET AL) 18 NOVEMBER 1997, ABSTRACT.		1, 8 AND 16
A	US 5,778,397 A (KUPIEC ET AL) 07 JULY 1998.		1-22
4	US 5,384,703 A (WITHGOTT ET AL) 24 JANUARY 1995.		1-22

INTERNATIONAL SEARCH REPORT

International application No. PCT/US00/04118

B. FIELDS SEARCHED Electronic data bases consulted (Name of data base and where practicable terms used):				
WEST/EAST search term: (summar\$ or abstract\$ or conden\$) same (document or text or information)				