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[Continued on next page]

(54) Title: COMPOUND DATA OBJECTS

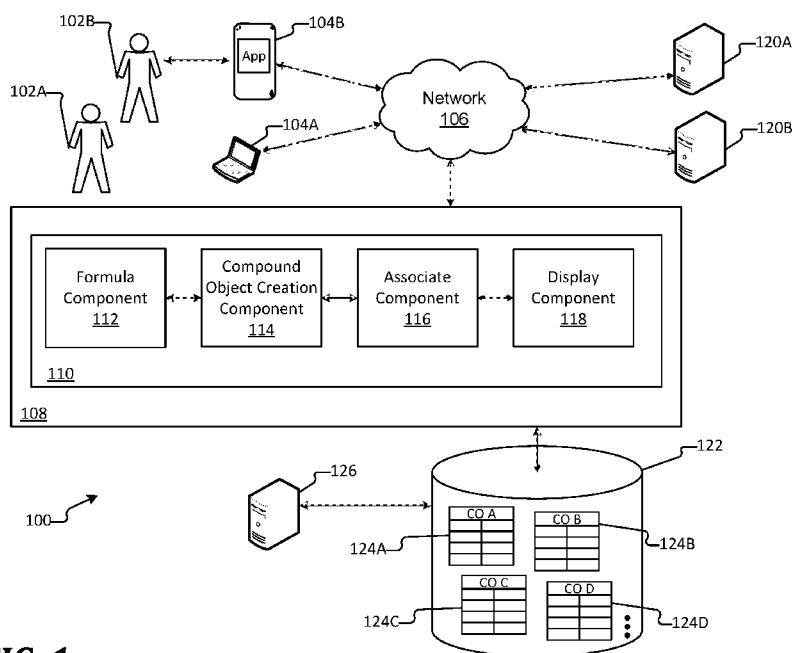


FIG. 1

(57) Abstract: The present disclosure describes a value referred to as a compound object that stores multiple values in a single cell, wherein those multiple values are organized according to a defined structure. The compound object may store multiple values according to a known defined data structure such as, for example, a record, vector, matrix, table, or array. In other embodiments, the compound object may store multiple values as any nested combination of any one of the known or user-defined data structures. Each of the values stored in the compound object are individually referenceable and can fully participate with spreadsheet functionality including calculations, referencing, and formatting.





(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

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

Published:

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— 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))

(88) Date of publication of the international search report:

17 August 2017

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F17/24
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 practicable, search terms used)
EPO-Internal, 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	EIRIK BAKKE ET AL: "A spreadsheet-based user interface for managing plural relationships in structured data", HUMAN FACTORS IN COMPUTING SYSTEMS, ACM, 2 PENN PLAZA, SUITE 701 NEW YORK NY 10121-0701 USA, 7 May 2011 (2011-05-07), pages 2541-2550, XP058041545, DOI: 10.1145/1978942.1979313 ISBN: 978-1-4503-0228-9 abstract page 2541, left-hand column, line 1 - page 2543, right-hand column, line 10 page 2544, left-hand column, line 11 - page 2547, left-hand column, line 27 figures 1-8 ----- -/--	1-7

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 application or patent 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

1 June 2017

Date of mailing of the international search report

12/07/2017

Name and mailing address of the ISA/
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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2016/060180

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>CHANG KERRY SHIH-PING ET AL: "A spreadsheet model for using web service data", 2014 IEEE SYMPOSIUM ON VISUAL LANGUAGES AND HUMAN-CENTRIC COMPUTING (VL/HCC), IEEE, 28 July 2014 (2014-07-28), pages 169-176, XP032633956, DOI: 10.1109/VLHCC.2014.6883042 [retrieved on 2014-08-25] abstract Sections III and IV</p> <p style="text-align: center;">-----</p>	1,3,5
X	<p>Brian C Whitmer: "Brigham Young University Improving Spreadsheets for Complex Problems", All Theses and Dissertations. Paper 1713, 8 April 2008 (2008-04-08), XP055339399, Brigham Young University, Provo, USA Retrieved from the Internet: URL:http://scholarsarchive.byu.edu/cgi/viewcontent.cgi?article=2712&context=etd [retrieved on 2017-01-26] abstract pages 1-7 pages 15-26 figures 1-16</p> <p style="text-align: center;">-----</p>	1,5,8-11
X	<p>US 2007/136652 A1 (ELLIS CHARLES D [US] ET AL) 14 June 2007 (2007-06-14) abstract paragraphs [0006] - [0032]</p> <p style="text-align: center;">-----</p>	1-3,5
X	<p>YANBO HAN ET AL: "Situational data integration with data services and nested table", SERVICE ORIENTED COMPUTING AND APPLICATIONS, vol. 7, no. 2, 27 April 2012 (2012-04-27), pages 129-150, XP055339499, London ISSN: 1863-2386, DOI: 10.1007/s11761-012-0103-5 abstract Sections 1-4</p> <p style="text-align: center;">-----</p>	12-21

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2016/060180

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.:
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:

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:

see additional sheet

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

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-11

Methods for the creation and editing of an object associated with a spreadsheet cell

2. claims: 12-21

Method of pattern identification in a spreadsheet.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2016/060180

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007136652	A1	14-06-2007	
		CN 101326490 A	17-12-2008
		KR 20080073733 A	11-08-2008
		TW I423050 B	11-01-2014
		US 2007136652 A1	14-06-2007
		WO 2007070322 A1	21-06-2007
