

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization

International Bureau

(43) International Publication Date  
14 March 2019 (14.03.2019)



W I P O | P C T



(10) International Publication Number  
**WO 2019/051131 A3**

(51) International Patent Classification:

G06F 21/55 (2013.01) G06Q 40/00 (2012.01)

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

04 April 2019 (04.04.2019)

(21) International Application Number:

PCT/US20 18/049807

(22) International Filing Date:

06 September 2018 (06.09.2018)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

15/696,367 06 September 2017 (06.09.2017) US

(71) Applicant: FRACTAL INDUSTRIES, INC. [US/US];

11091 Sunset Hill Road, Suite 210, Reston, VA 20190 (US).

(72) Inventors: CRABTREE, Jason; 10208 Westford Drive,

Vienna, VA 22182 (US). SELLERS, Andrew; 6940 Bar-  
rimore Drive, Colorado Springs, CO 80923 (US).

(74) Agent: GALVIN, Brian, R.; GalvinPatentLaw LLC, 2916

NW Bucklin Hill Road, Suite 485, Silverdale, WA 98383  
(US).

(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, JO, JP, KE, KG, KH, 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.

(84) Designated States (unless otherwise indicated, for every

kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ,  
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,  
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, 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).

Published:

- with international search report (Art. 21(3))
- 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))

(54) Title: ADVANCED CYBERSECURITY THREAT MITIGATION FOR INTER-BANK FINANCIAL TRANSACTIONS

(57) Abstract: A system for mitigation of cyberattacks employing an advanced cyber decision platform comprising a time series data store, a directed computational graph module, an action outcome simulation module, and observation and state estimation module, wherein the state of a network is monitored and used to produce a cyber-physical graph representing network resources, simulated network events are produced and monitored, and the network events and their effects are analyzed to produce security recommendations.

WO 2019/051131 A3

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US 2018/049807

<p>A. CLASSIFICATION OF SUBJECT MATTER</p> <p style="text-align: center;"><i>G06F 21/55 (2006.01)</i> <i>G06Q 40/00 (2012.01)</i></p> <p>According to International Patent Classification (IPC) or to both national classification and IPC</p>																	
<p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols)</p> <p style="text-align: center;">G06F 17/00, 17/30, 17/50, 15/00-15/16, 21/00, 21/50-21/56, 21/60, H04L 29/00, 29/06, G06Q 40/00</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p> <p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)</p> <p style="text-align: center;">PatSearch (RUPTO Internal), USPTO, PAJ, Espacenet, Information Retrieval System of FIPS</p>																	
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Category*</th> <th style="width: 70%;">Citation of document, with indication, where appropriate, of the relevant passages</th> <th style="width: 20%;">Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Y</td> <td>US 2015/0295948 A1 (SUZANNE P. HASSELL et al.) 15.10.2015, paragraphs [0013], [0018], [0020] - [0021], [0023] - [0025], [0029] - [0030], [0040], [0042] - [0043], [0046], [0048], [0050], [0053] - [0054], [0056]</td> <td style="text-align: center;">1-7</td> </tr> <tr> <td style="text-align: center;">Y</td> <td>US 8768838 B1 (NEXUS PAYMENTS, LLC) 01.07.2014, col. 1, lines 55-60, col. 2, lines 37-41, col. 3, lines 44-58</td> <td style="text-align: center;">1-6</td> </tr> <tr> <td style="text-align: center;">Y</td> <td>US 2013/0198840 A1 (INTERNATIONAL BUSINESS MACHINES CORPORATION) 01.08.2013, paragraphs [0030] - [0031], [0038] - [0042]</td> <td style="text-align: center;">1-7</td> </tr> <tr> <td style="text-align: center;">A</td> <td>US 9225730 B1 (AMAZON TECHNOLOGIES, INC.) 29.12.2015</td> <td style="text-align: center;">1-7</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y	US 2015/0295948 A1 (SUZANNE P. HASSELL et al.) 15.10.2015, paragraphs [0013], [0018], [0020] - [0021], [0023] - [0025], [0029] - [0030], [0040], [0042] - [0043], [0046], [0048], [0050], [0053] - [0054], [0056]	1-7	Y	US 8768838 B1 (NEXUS PAYMENTS, LLC) 01.07.2014, col. 1, lines 55-60, col. 2, lines 37-41, col. 3, lines 44-58	1-6	Y	US 2013/0198840 A1 (INTERNATIONAL BUSINESS MACHINES CORPORATION) 01.08.2013, paragraphs [0030] - [0031], [0038] - [0042]	1-7	A	US 9225730 B1 (AMAZON TECHNOLOGIES, INC.) 29.12.2015	1-7
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.															
Y	US 2015/0295948 A1 (SUZANNE P. HASSELL et al.) 15.10.2015, paragraphs [0013], [0018], [0020] - [0021], [0023] - [0025], [0029] - [0030], [0040], [0042] - [0043], [0046], [0048], [0050], [0053] - [0054], [0056]	1-7															
Y	US 8768838 B1 (NEXUS PAYMENTS, LLC) 01.07.2014, col. 1, lines 55-60, col. 2, lines 37-41, col. 3, lines 44-58	1-6															
Y	US 2013/0198840 A1 (INTERNATIONAL BUSINESS MACHINES CORPORATION) 01.08.2013, paragraphs [0030] - [0031], [0038] - [0042]	1-7															
A	US 9225730 B1 (AMAZON TECHNOLOGIES, INC.) 29.12.2015	1-7															
<p><input type="checkbox"/> Further documents are listed in the continuation of Box C. <span style="margin-left: 150px;"><input type="checkbox"/> See patent family annex.</span></p>																	
<p>* Special categories of cited documents:</p> <table style="width: 100%;"> <tr> <td style="width: 50%;"> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </td> <td style="width: 50%;"> <p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p> </td> </tr> </table>			<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p>													
<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p>																
<p>Date of the actual completion of the international search</p> <p style="text-align: center;">17 January 2019 (17.01.2019)</p>		<p>Date of mailing of the international search report</p> <p style="text-align: center;">28 February 2019 (28.02.2019)</p>															
<p>Name and mailing address of the ISA/RU: Federal Institute of Industrial Property, Berezhkovskaya nab., 30-1, Moscow, G-59, GSP-3, Russia, 125993 Facsimile No: (8-495) 531-63-18, (8-499) 243-33-37</p>		<p>Authorized officer</p> <p style="text-align: center;">S. Parusov</p> <p>Telephone No. 8(495) 531-64-8 1</p>															