Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	X1.002C4
	Application Number	
Title of Invention	METHODS AND SYSTEMS FOR SEARCH INDEXING	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	William		Gross	

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

City	Pasadena	State/Province	CA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	130 West Union Street		
Address 2			
City	Pasadena	State/Province	CA
Postal Code	91103	Country i	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Steven	Lee	Colwell	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

City	Santa Barbara	State/Province	CA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	2265 Las Canoas Road		
Address 2			
City	Santa Barbara	State/Province	CA
Postal Code	93105	Country i	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).

MICROSOFT EXHIBIT 1002

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	X1.002C4
	Application Number	
Title of Invention	METHODS AND SYSTEMS FOR SEARCH INDEXING	

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	20995		
Email Address	efiling@knobbe.com	Add Email	Remove Email

Application Information:

Title of the Invention	METHODS AND SYSTEMS FOR SEARCH INDEXING		
Attorney Docket Number	X1.002C4	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	23	**Suggested Figure for Publication (if any)**	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	20995		

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	X1.002C4
	Application Number	
Title of Invention	METHODS AND SYSTEMS FOR SEARCH INDEXING	

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	14/507519	2014-10-06

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14/507519	Continuation of	11/972563	2008-01-10	8856093	2014-10-06

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
11/972563	Continuation of	10/654588	2003-09-03	7370035	2008-05-06

Prior Application Status	Abandoned		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
10/654588	Claims benefit of provisional	60/408015	2002-09-03

Prior Application Status	Abandoned		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
10/654588	Claims benefit of provisional	60/413013	2002-09-23

Prior Application Status	Abandoned		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
10/654588	Claims benefit of provisional	60/448923	2003-02-20

Prior Application Status	Abandoned		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
10/654588	Claims benefit of provisional	60/470903	2003-05-14

Prior Application Status	Abandoned		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
10/654588	Claims benefit of provisional	60/478960	2003-06-13

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	X1.002C4
	Application Number	
Title of Invention	METHODS AND SYSTEMS FOR SEARCH INDEXING	

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	X1.002C4
	Application Number	
Title of Invention	METHODS AND SYSTEMS FOR SEARCH INDEXING	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	X1.002C4
	Application Number	
Title of Invention	METHODS AND SYSTEMS FOR SEARCH INDEXING	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section. Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	FUTURE SEARCH HOLDINGS, INC.		
Mailing Address Information For Applicant:			
Address 1	130 W. Union Street		
Address 2			
City	Pasadena	**State/Province**	CA
Country	US	Postal Code	91103
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	X1.002C4
	Application Number	
Title of Invention	METHODS AND SYSTEMS FOR SEARCH INDEXING	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Russell M. Jeide/			Date (YYYY-MM-DD)	2017-04-24
First Name	Russell	Last Name	Jeide	Registration Number	54198

Additional Signature may be generated within this form by selecting the Add button. Add

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	X1.002C4
	Application Number	
Title of Invention	METHODS AND SYSTEMS FOR SEARCH INDEXING	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

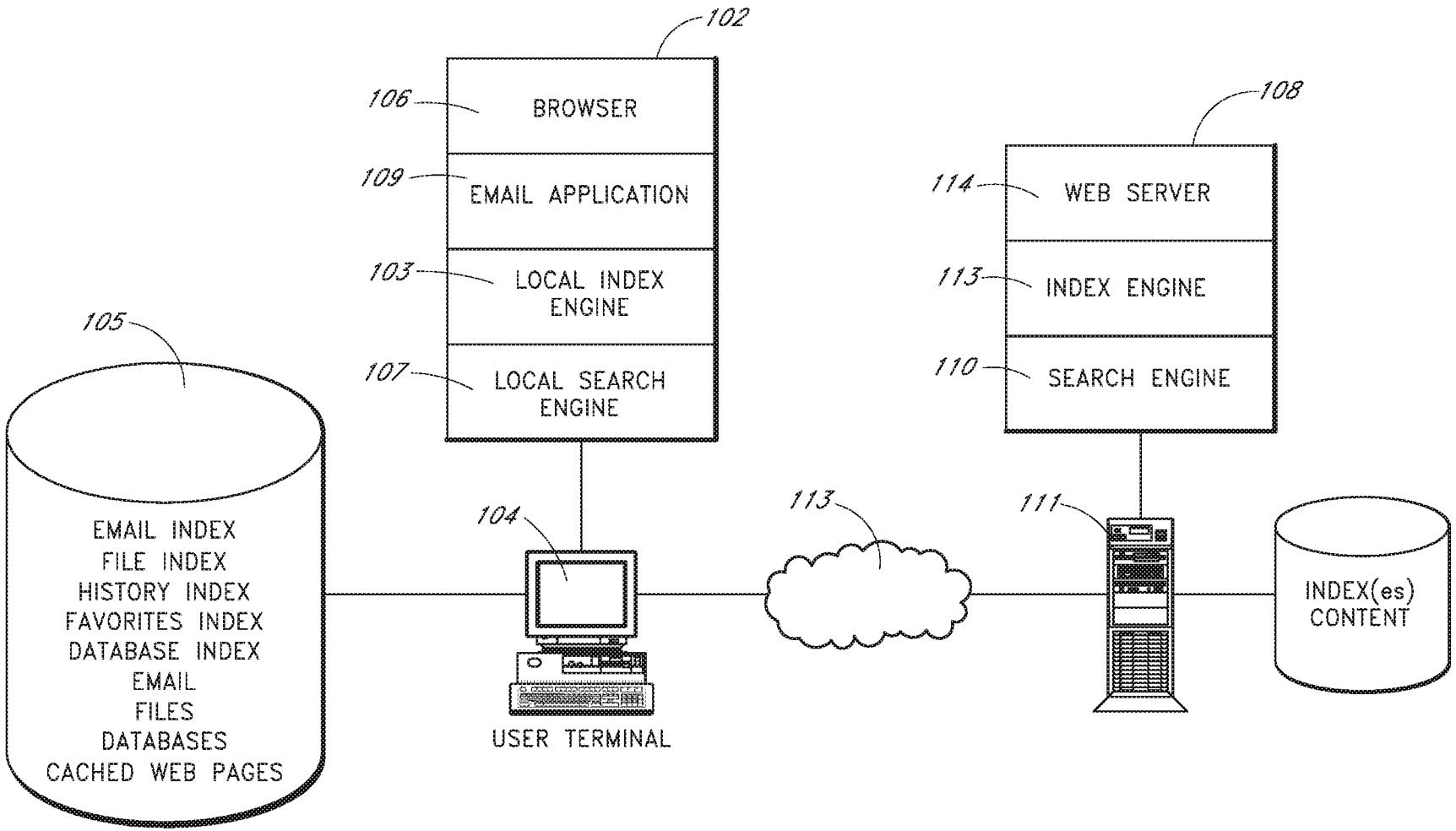
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.


102
106
BROWSER
109
EMAIL APPLICATION
103
LOCAL INDEX ENGINE
107
LOCAL SEARCH ENGINE
105
EMAIL INDEX
FILE INDEX
HISTORY INDEX
FAVORITES INDEX
DATABASE INDEX
EMAIL
FILES
DATABASES
CACHED WEB PAGES
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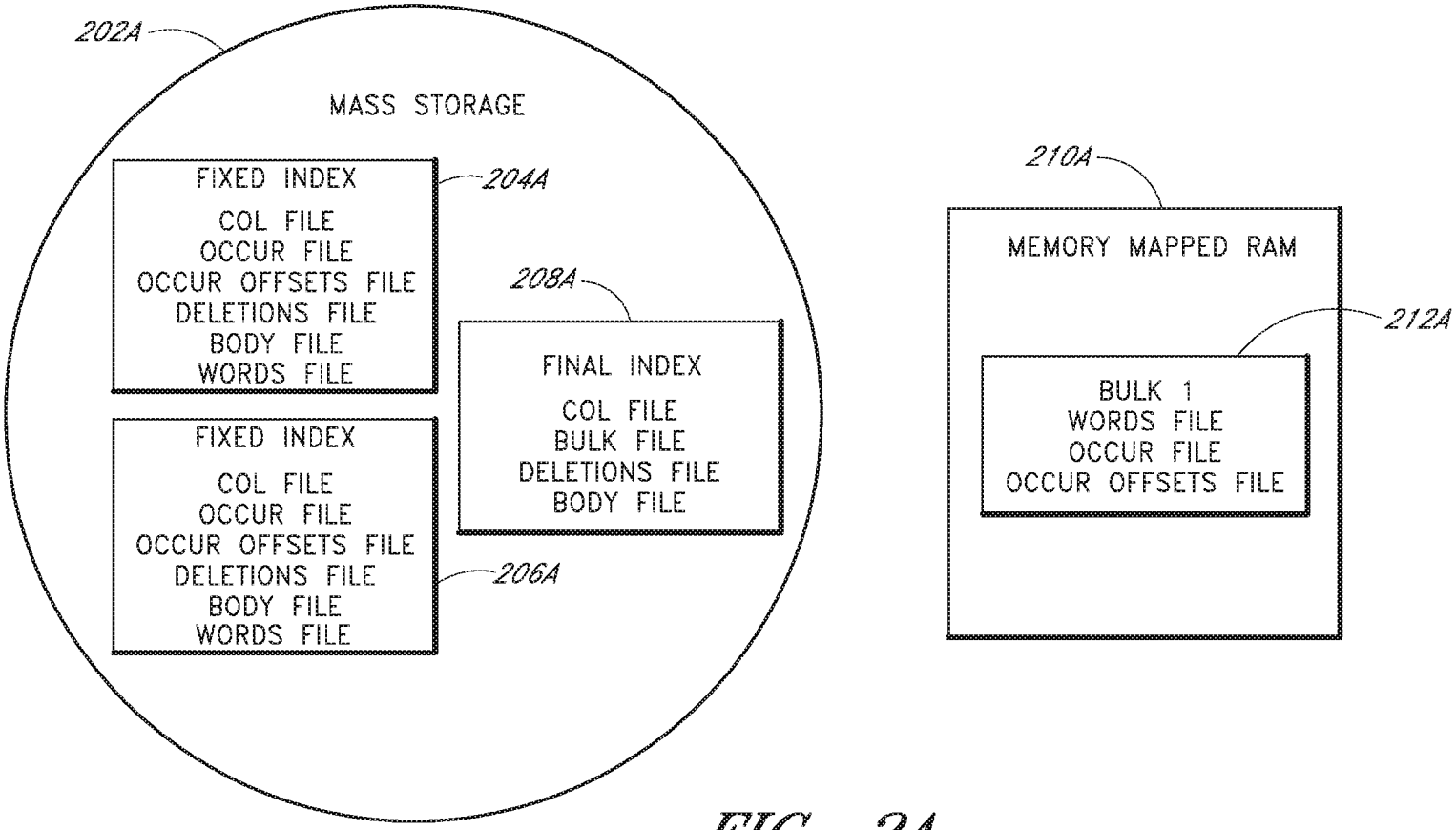
INDEX(es) CONTENT

FIG. 1


202A
MASS STORAGE
FIXED INDEX
COL FILE
OCCUR FILE
OCCUR OFFSETS FILE
DELETIONS FILE
BODY FILE
WORDS FILE
204A
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OCCUR FILE
OCCUR OFFSETS FILE
DELETIONS FILE
BODY FILE
WORDS FILE
206A
208A
FINAL INDEX
COL FILE
BULK FILE
DELETIONS FILE
BODY FILE
210A
MEMORY MAPPED RAM
212A
BULK 1
WORDS FILE
OCCUR FILE
OCCUR OFFSETS FILE

FIG. 2A

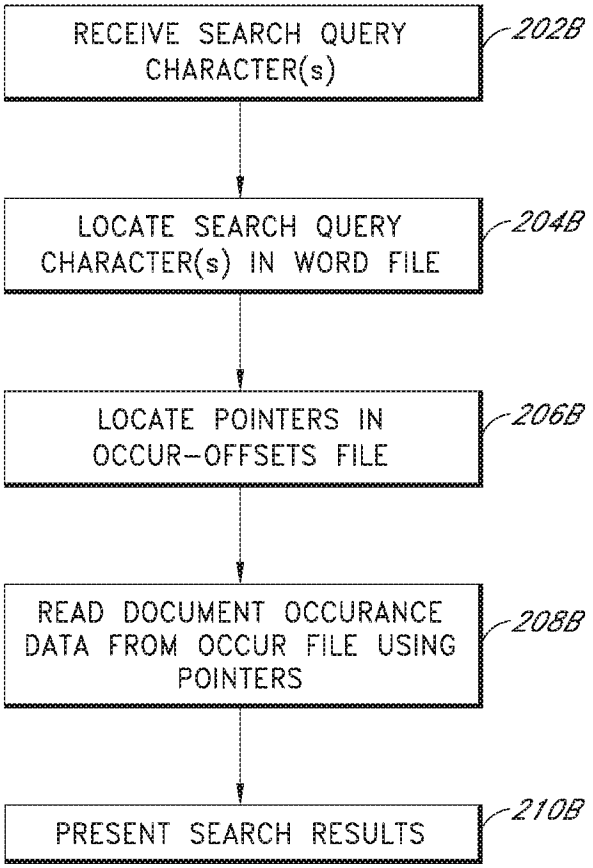

RECEIVE SEARCH QUERY CHARACTER(s)
202B
LOCATE SEARCH QUERY CHARACTER(s) IN WORD FILE
204B
LOCATE POINTERS IN OCCUR-OFFSETS FILE
206B
READ DOCUMENT OCCURANCE DATA FROM OCCUR FILE USING POINTERS
208B
PRESENT SEARCH RESULTS
210B

FIG. 2B

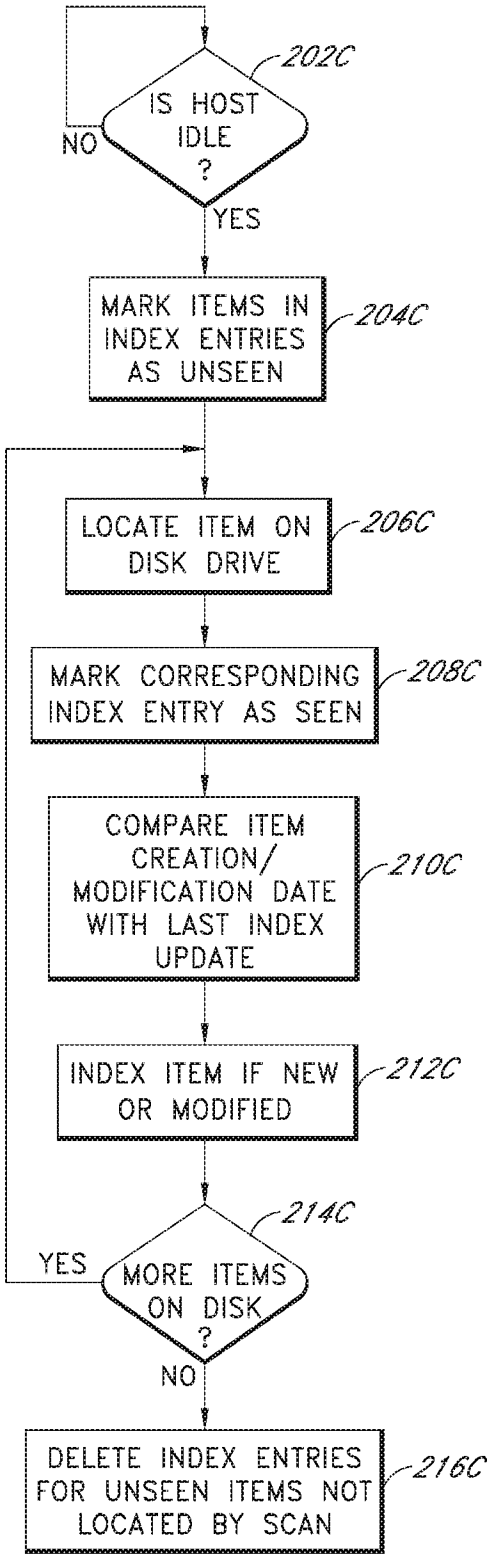

202C
IS HOST IDLE ?
NO
YES
MARK ITEMS IN INDEX ENTRIES AS UNSEEN
204C
LOCATE ITEM ON DISK DRIVE
206C
MARK CORRESPONDING INDEX ENTRY AS SEEN
208C
COMPARE ITEM CREATION/ MODIFICATION DATE WITH LAST INDEX UPDATE
210C
INDEX ITEM IF NEW OR MODIFIED
212C
214C
YES
MORE ITEMS ON DISK ?
NO
DELETE INDEX ENTRIES FOR UNSEEN ITEMS NOT LOCATED BY SCAN
216C

FIG. 2C

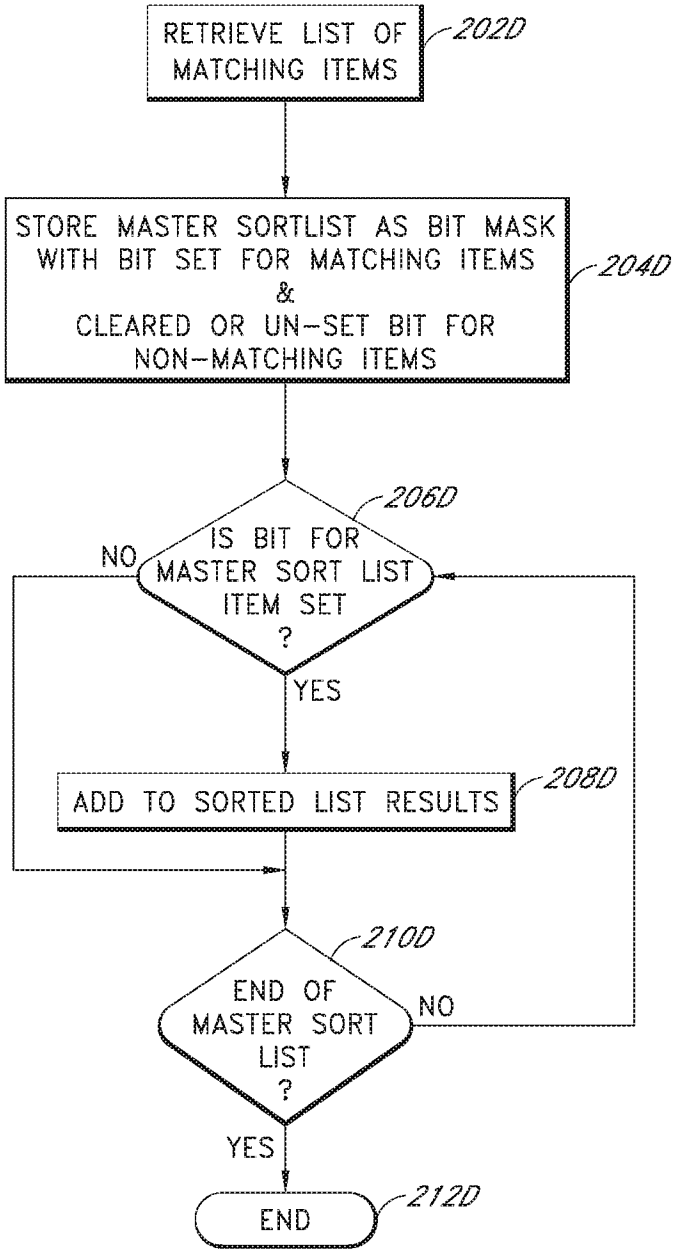
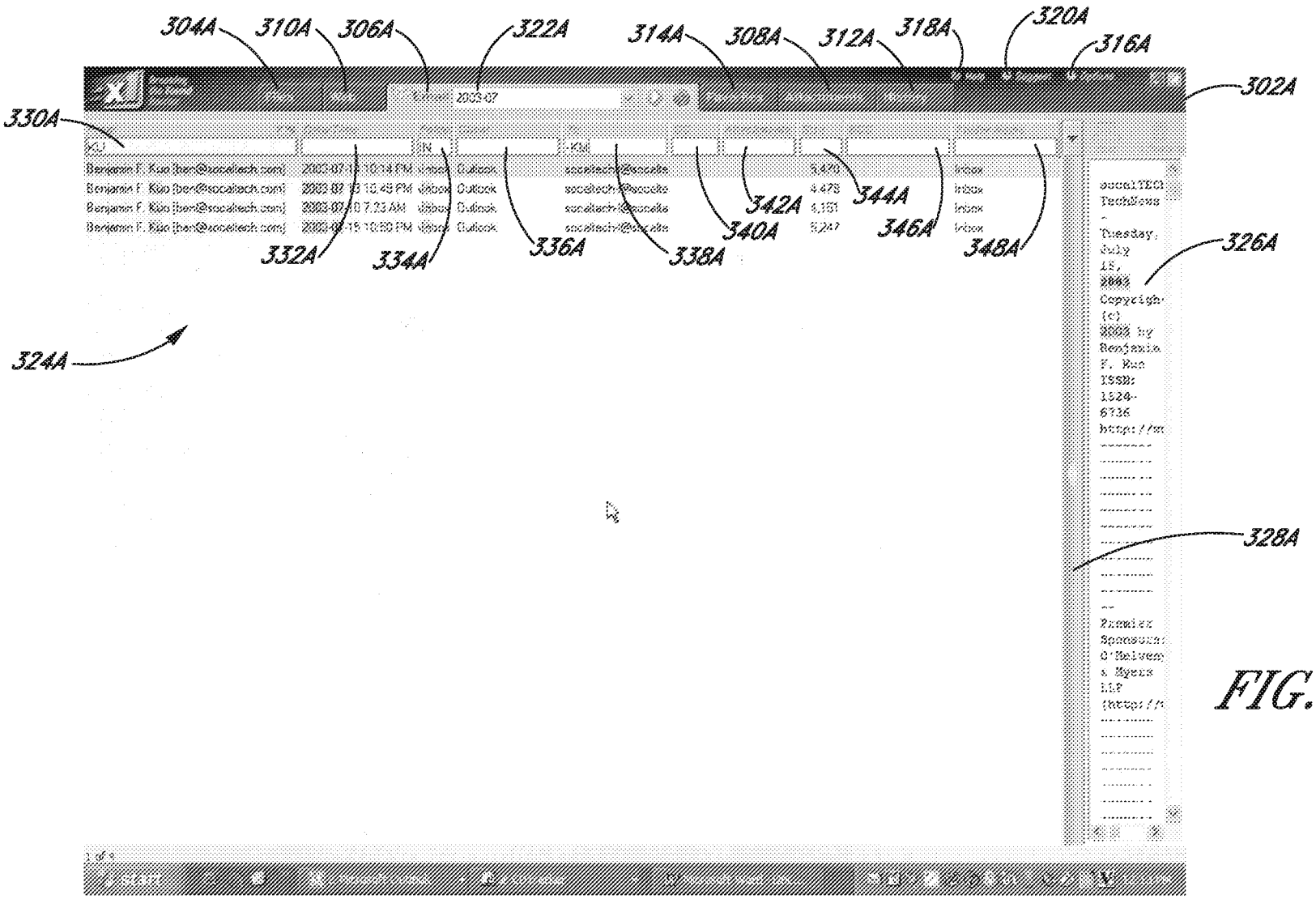

RETRIEVE LIST OF MATCHING ITEMS
202D
STORE MASTER SORTLIST AS BIT MASK WITH BIT SET FOR MATCHING ITEMS & CLEARED OR UN-SET BIT FOR NON-MATCHING ITEMS
204D
IS BIT FOR MASTER SORT LIST ITEM SET ?
206D
NO
YES
ADD TO SORTED LIST RESULTS
208D
END OF MASTER SORT LIST ?
210D
NO
YES
END
212D

FIG. 2D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316A
302A
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336A
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340A
342A
344A
346A
348A
326A
328A
324A

FIG. 3A

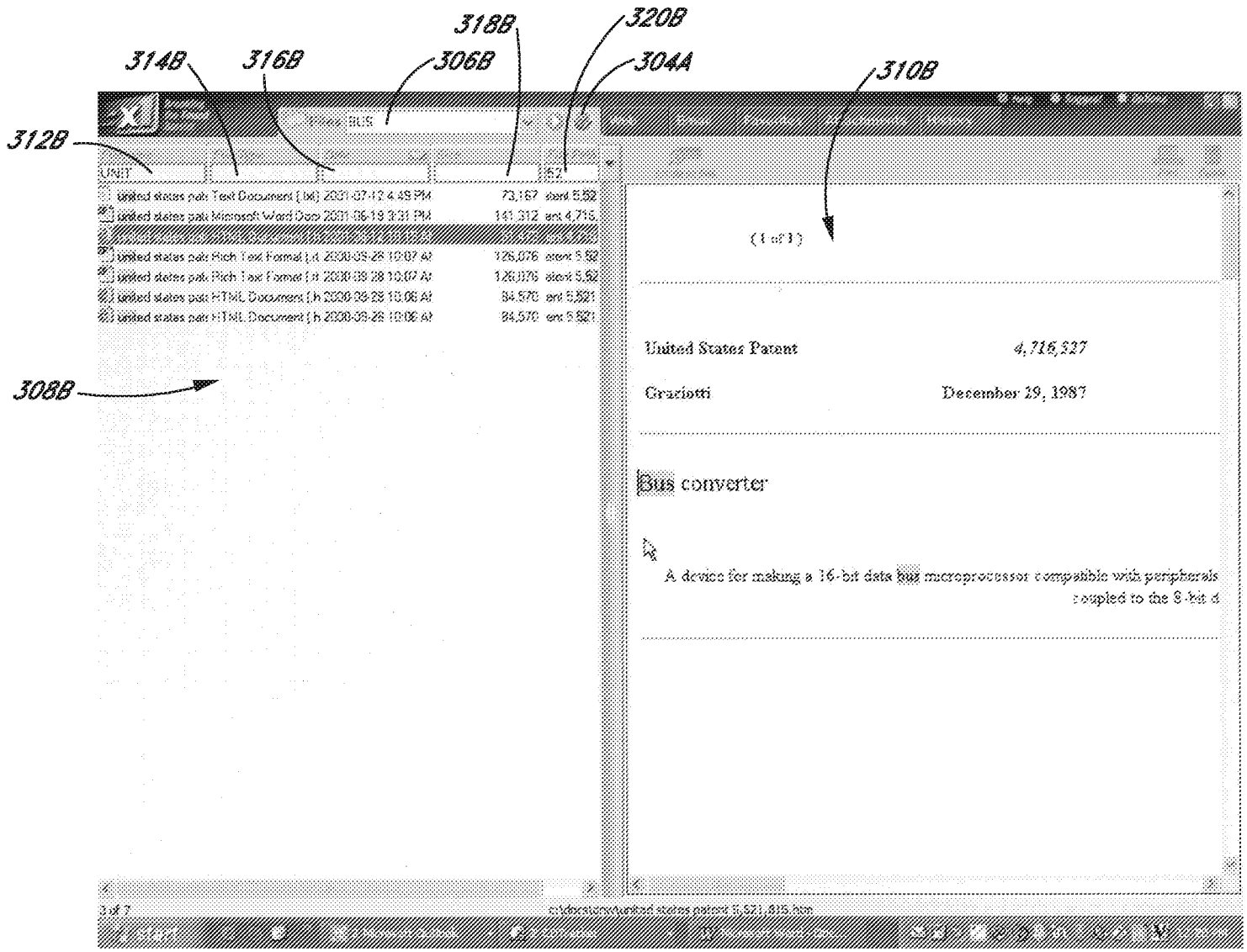

312B
314B
316B
306B
318B
320B
304A
310B
308B
BUS
United States Patent
4,716,327
Graziotti
December 19, 1987
Bus converter
A device for making a 16-bit data bus microprocessor compatible with peripherals

FIG. 3B

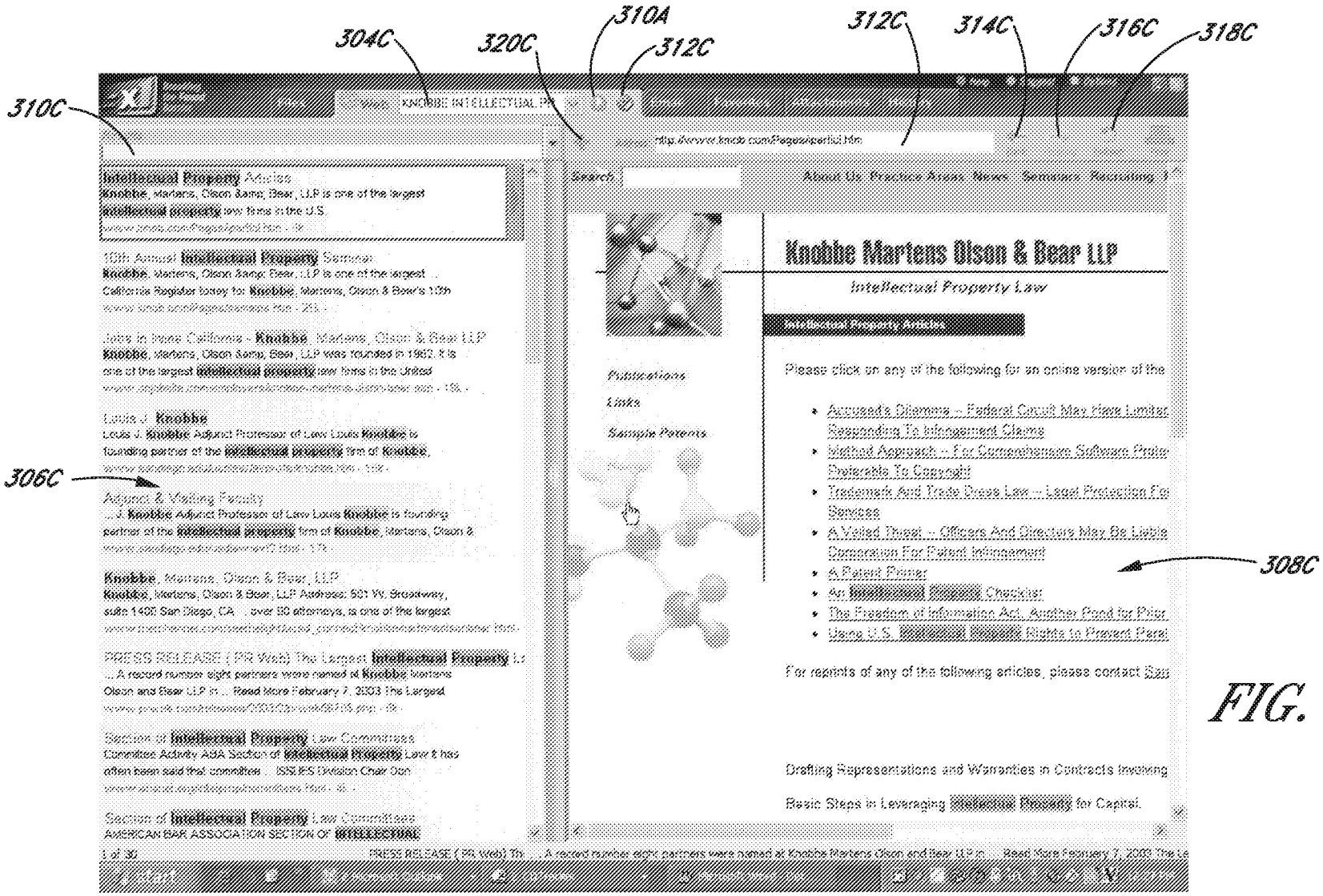

310C
304C
320C
310A
312C
312C
314C
316C
318C
306C
308C
Knobbe Martens Olson & Bear LLP
Intellectual Property Law
Please click on any of the following for an online version of the
For reprints of any of the following articles, please contact

FIG. 3C

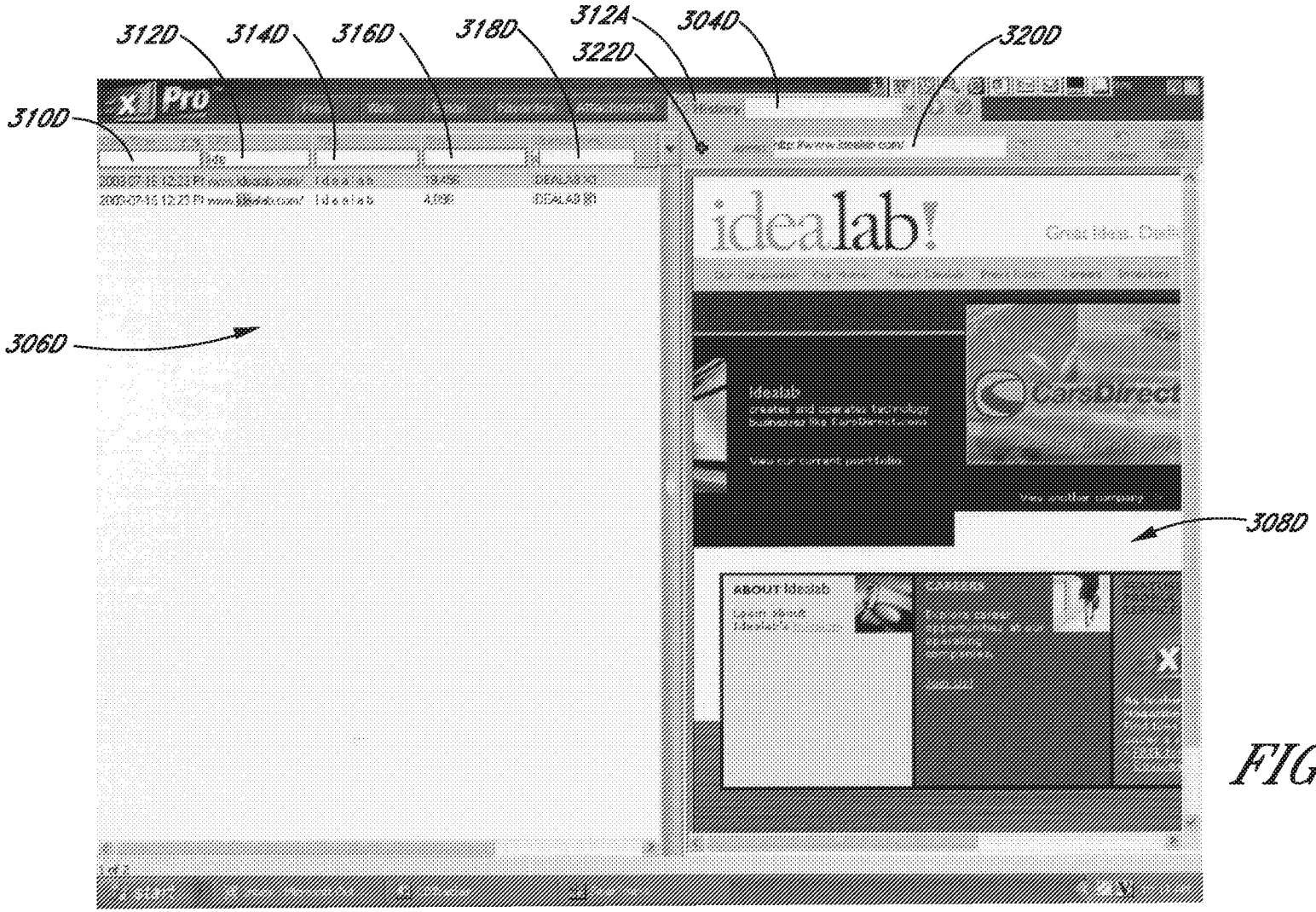
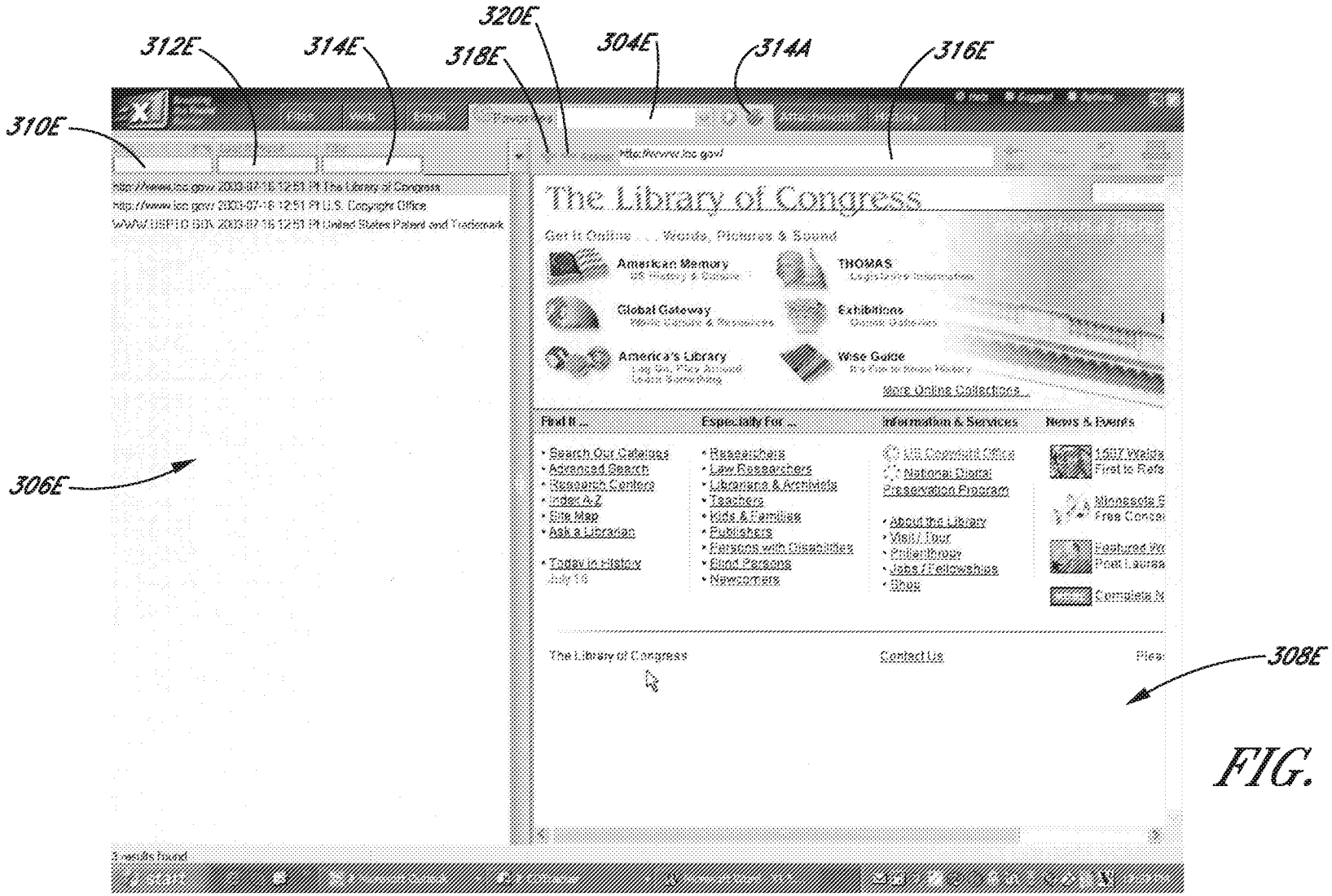

312D
314D
316D
318D
312A
304D
322D
320D
310D
306D
308D
Pro
idealab!
ABOUT idealab

FIG. 3D


310E
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314E
318E
320E
304E
314A
316E
306E
308E
The Library of Congress
American Memory
THOMAS
Global Gateway
Exhibitions
America's Library
Wise Guide
Find It ...
Especially For ...
Information & Services
News & Events
Search Our Catalogs
Advanced Search
Research Centers
Index A-Z
Site Map
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FIG. 3E

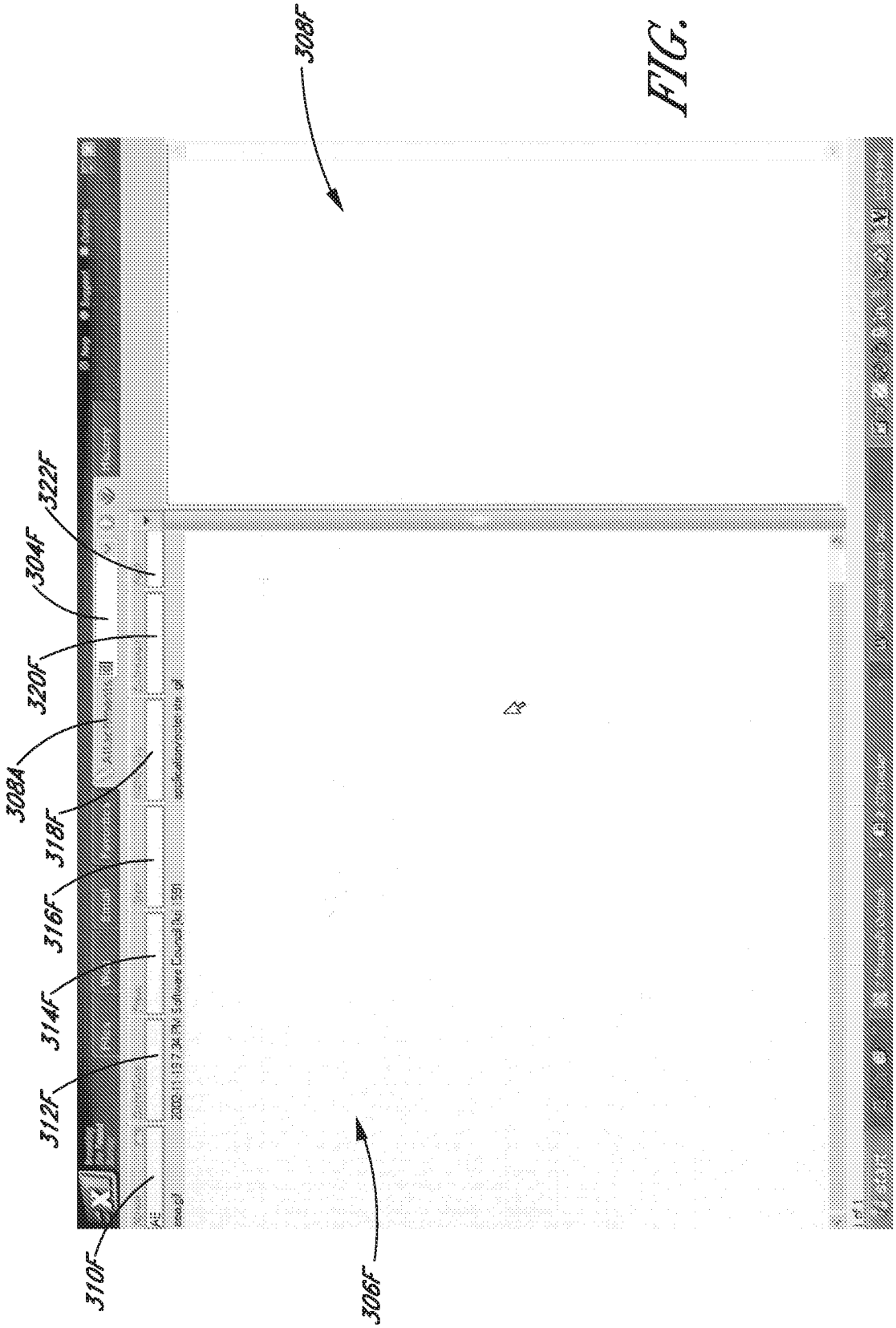
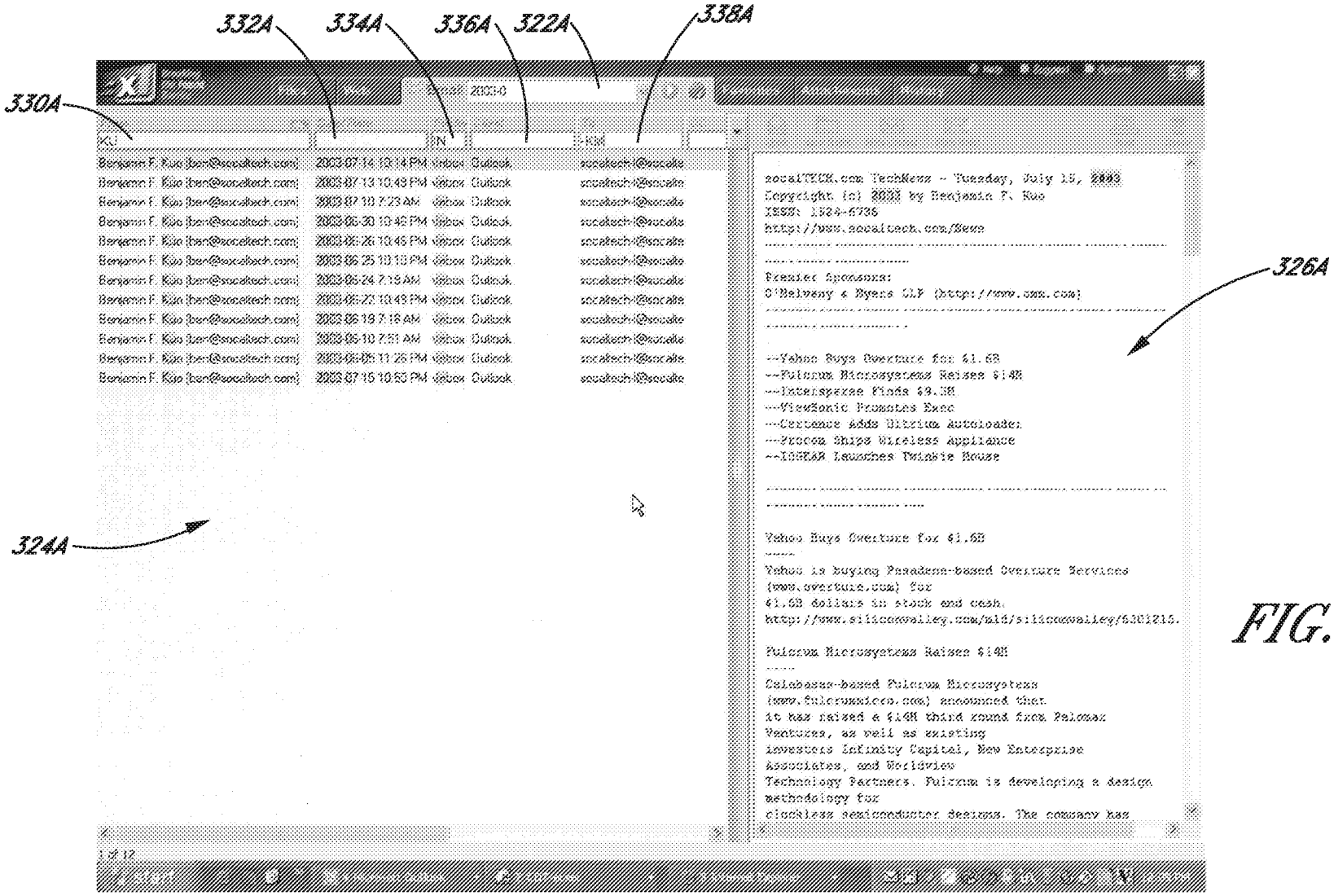


FIG. 3F


330A
332A
334A
336A
322A
338A
324A
326A
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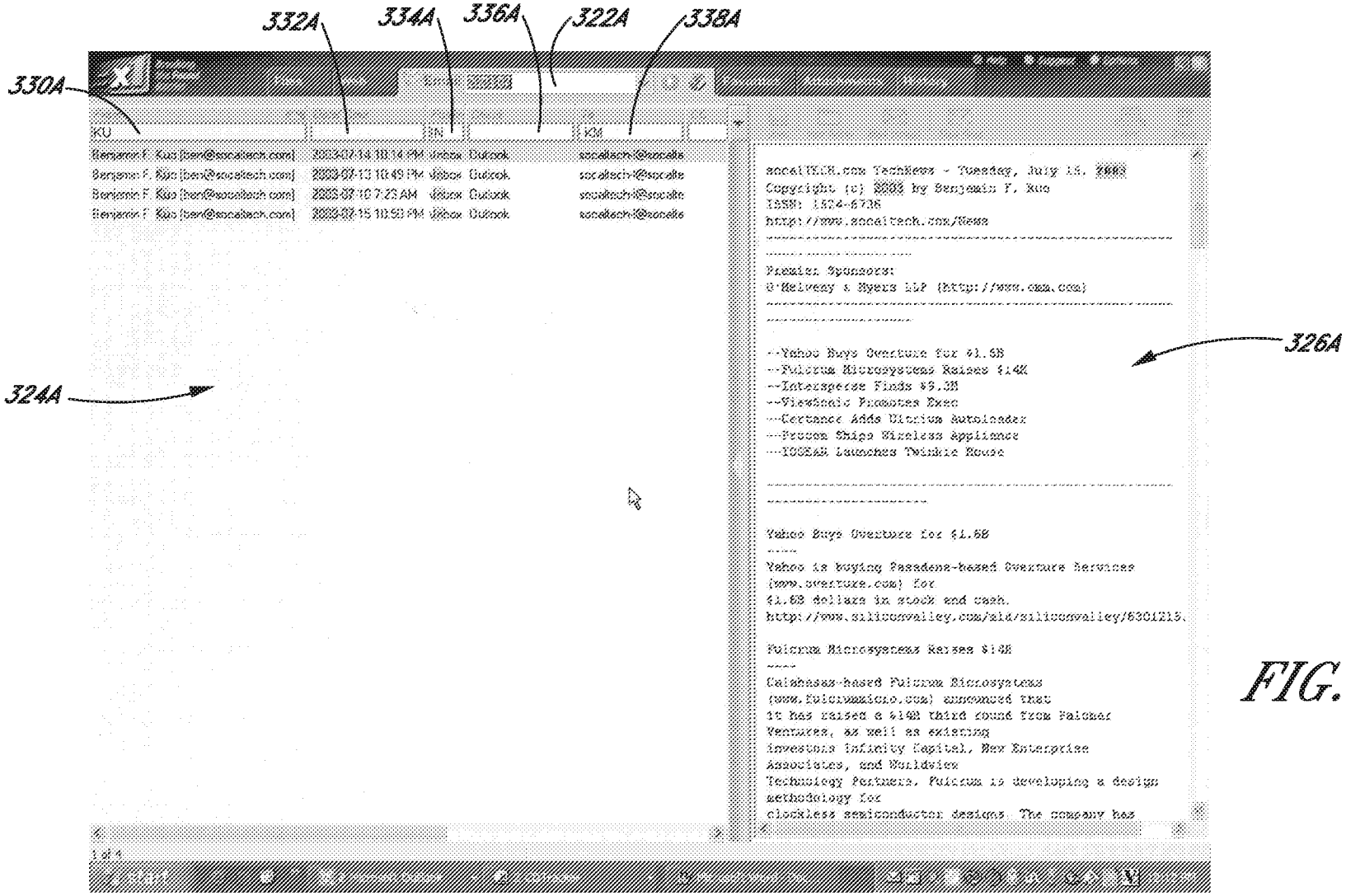
--Yahoo Buys Overture for $1.6B
--Fulcrum Microsystems Raises $14M
--Interspace Finds $9.5M
--ViewSonic Promotes Exec
--Certance Adds Ultrium Autoloader
--Procom Ships Wireless Appliance
--IOGEAR Launches Twinkle House
Yahoo Buys Overture for $1.6B
Yahoo is buying Pasadena-based Overture Services
(www.overture.com) for
$1.6B dollars in stock and cash.
http://www.siliconvalley.com/mld/siliconvalley/6301215.
Fulcrum Microsystems Raises $14M
Calabasas-based Fulcrum Microsystems
(www.fulcrumicro.com) announced that
it has raised a $14M third round from Palomar
Ventures, as well as existing
investors Infinity Capital, New Enterprise
Associates, and Worldview
Technology Partners. Fulcrum is developing a design
methodology for
clockless semiconductor designs. The company has

FIG. 3G


330A
332A
334A
336A
322A
338A
324A
326A
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--Interspace Finds $9.3M
--Viewsonic Promotes Exec
--Certance Adds Ultrium Autoloader
--Proxim Ships Wireless Appliance
--IOGEAR Launches Twinkie House
Yahoo Buys Overture for $1.6B
Yahoo is buying Pasadena-based Overture Services
(www.overture.com) for
$1.6B dollars in stock and cash.
http://www.siliconvalley.com/mld/siliconvalley/6301215.
Fulcrum Microsystems Raises $14M
Calabasas-based Fulcrum Microsystems
(www.fulcrummicro.com) announced that
it has raised a $14M third round from Palomar
Ventures, as well as existing
investors Infinity Capital, New Enterprise
Associates, and Worldview
Technology Partners. Fulcrum is developing a design
methodology for
clockless semiconductor designs. The company has

FIG. 3H

FIG. 3I

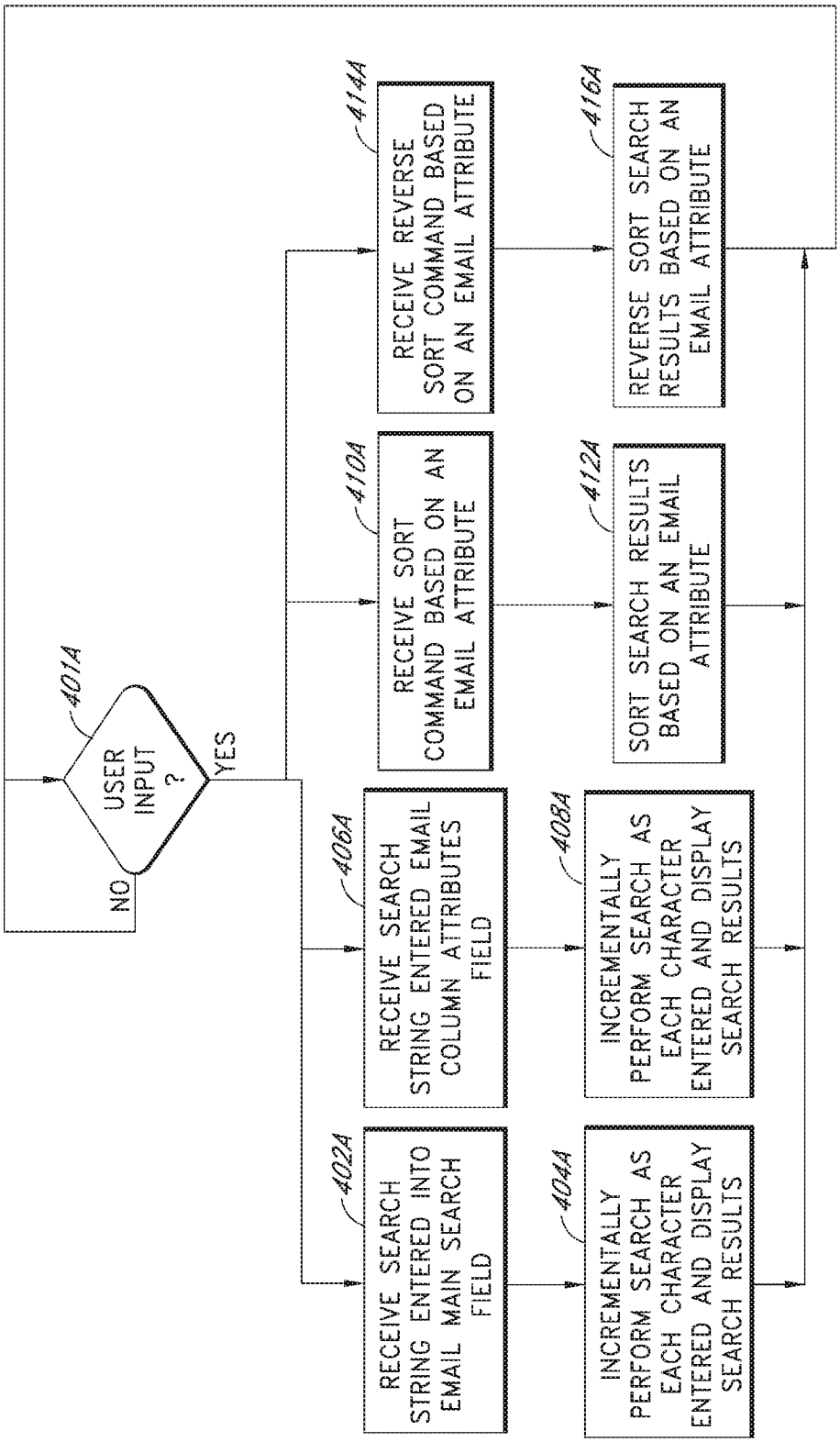
401A
USER INPUT ?
NO
YES
402A
RECEIVE SEARCH STRING ENTERED INTO EMAIL MAIN SEARCH FIELD
404A
INCREMENTALLY PERFORM SEARCH AS EACH CHARACTER ENTERED AND DISPLAY SEARCH RESULTS
406A
RECEIVE SEARCH STRING ENTERED EMAIL COLUMN ATTRIBUTES FIELD
408A
INCREMENTALLY PERFORM SEARCH AS EACH CHARACTER ENTERED AND DISPLAY SEARCH RESULTS
410A
RECEIVE SORT COMMAND BASED ON AN EMAIL ATTRIBUTE
412A
SORT SEARCH RESULTS BASED ON AN EMAIL ATTRIBUTE
414A
RECEIVE REVERSE SORT COMMAND BASED ON AN EMAIL ATTRIBUTE
416A
REVERSE SORT SEARCH RESULTS BASED ON AN EMAIL ATTRIBUTE

FIG. 4A

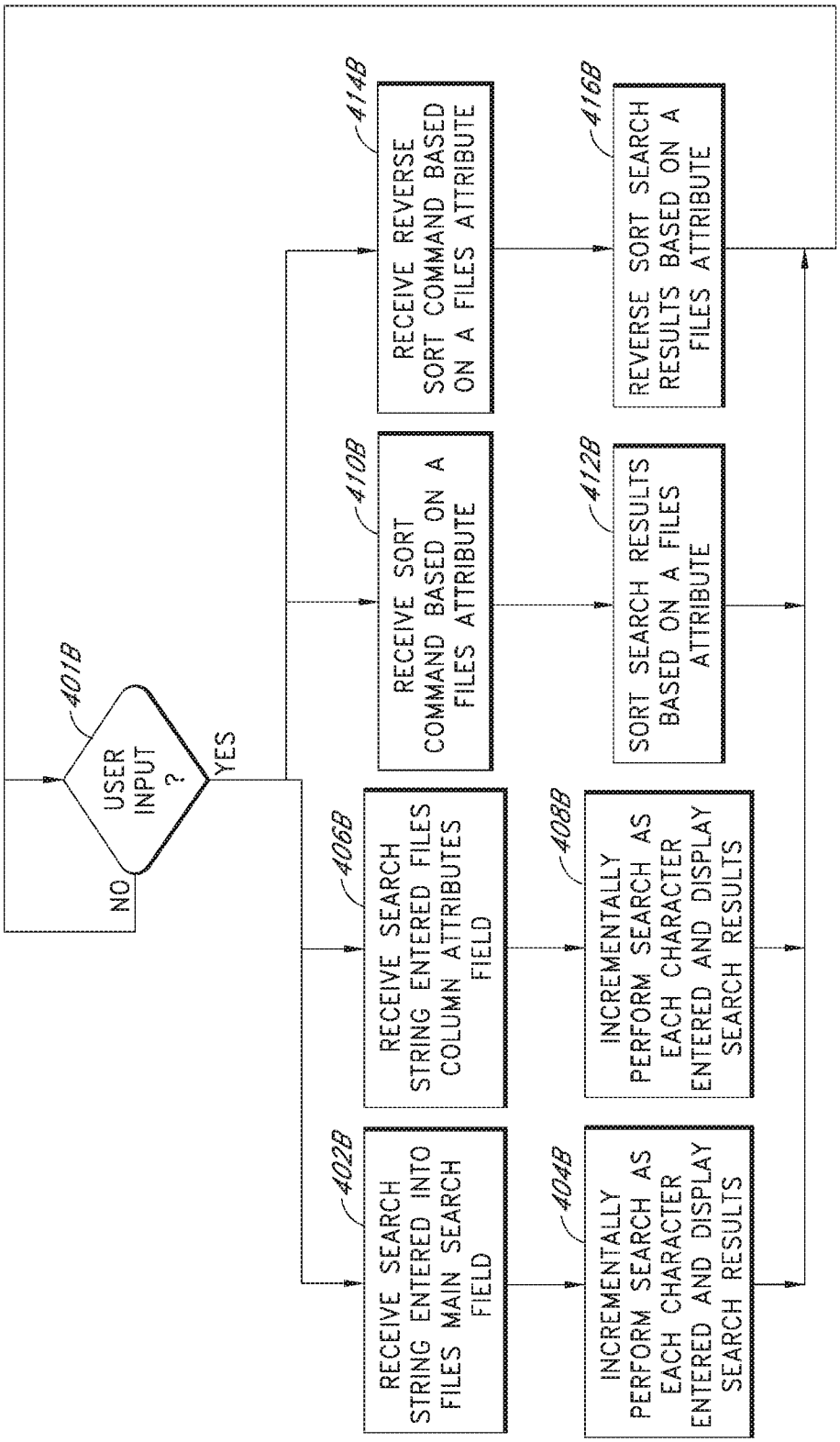
401B
USER INPUT ?
NO
YES
402B
RECEIVE SEARCH STRING ENTERED INTO FILES MAIN SEARCH FIELD
404B
INCREMENTALLY PERFORM SEARCH AS EACH CHARACTER ENTERED AND DISPLAY SEARCH RESULTS
406B
RECEIVE SEARCH STRING ENTERED FILES COLUMN ATTRIBUTES FIELD
408B
INCREMENTALLY PERFORM SEARCH AS EACH CHARACTER ENTERED AND DISPLAY SEARCH RESULTS
410B
RECEIVE SORT COMMAND BASED ON A FILES ATTRIBUTE
412B
SORT SEARCH RESULTS BASED ON A FILES ATTRIBUTE
414B
RECEIVE REVERSE SORT COMMAND BASED ON A FILES ATTRIBUTE
416B
REVERSE SORT SEARCH RESULTS BASED ON A FILES ATTRIBUTE

FIG. 4B

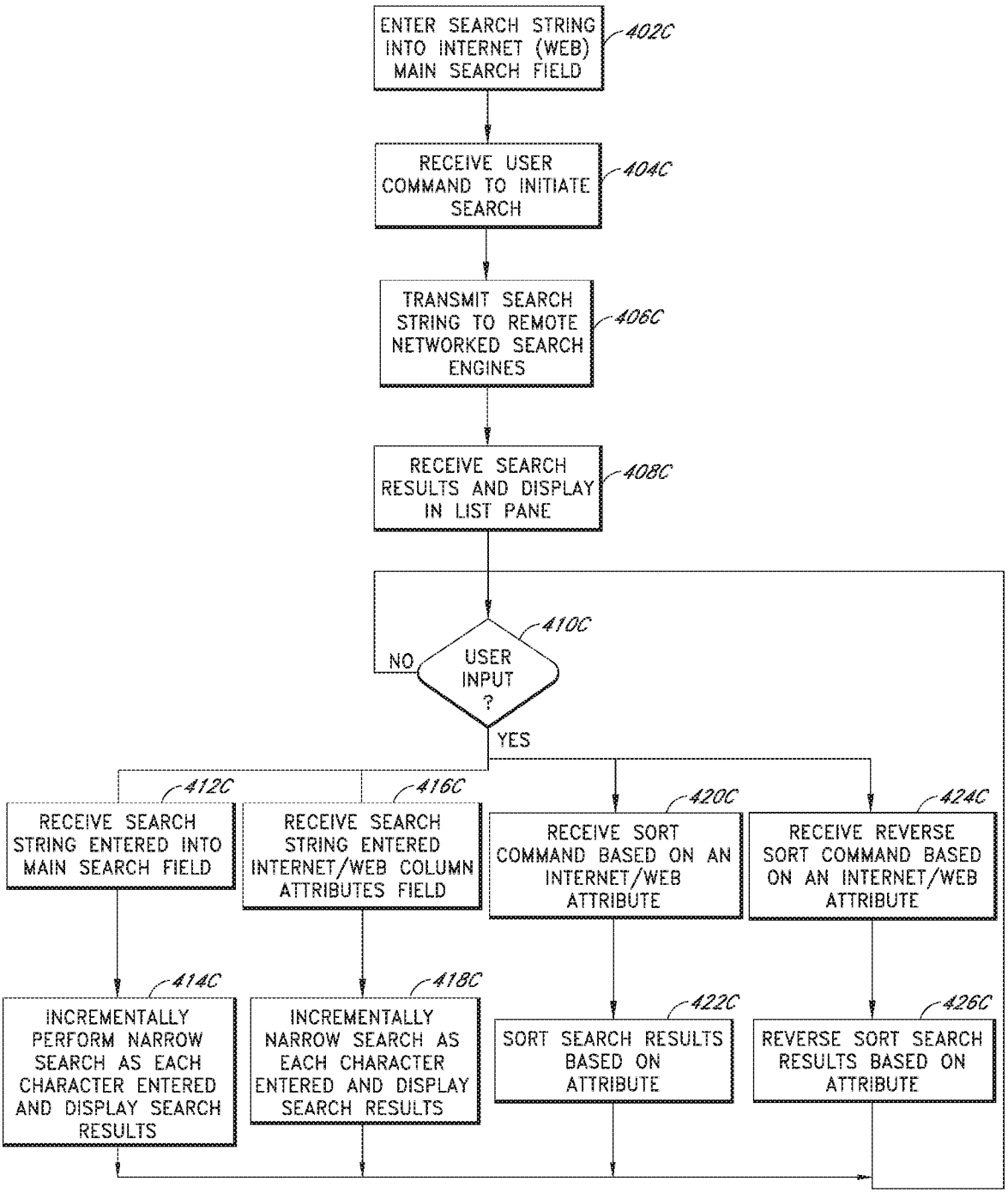
ENTER SEARCH STRING INTO INTERNET (WEB) MAIN SEARCH FIELD
402C
RECEIVE USER COMMAND TO INITIATE SEARCH
404C
TRANSMIT SEARCH STRING TO REMOTE NETWORKED SEARCH ENGINES
406C
RECEIVE SEARCH RESULTS AND DISPLAY IN LIST PANE
408C
410C
USER INPUT ?
NO
YES
412C
RECEIVE SEARCH STRING ENTERED INTO MAIN SEARCH FIELD
416C
RECEIVE SEARCH STRING ENTERED INTERNET/WEB COLUMN ATTRIBUTES FIELD
420C
RECEIVE SORT COMMAND BASED ON AN INTERNET/WEB ATTRIBUTE
424C
RECEIVE REVERSE SORT COMMAND BASED ON AN INTERNET/WEB ATTRIBUTE
414C
INCREMENTALLY PERFORM NARROW SEARCH AS EACH CHARACTER ENTERED AND DISPLAY SEARCH RESULTS
418C
INCREMENTALLY NARROW SEARCH AS EACH CHARACTER ENTERED AND DISPLAY SEARCH RESULTS
422C
SORT SEARCH RESULTS BASED ON ATTRIBUTE
426C
REVERSE SORT SEARCH RESULTS BASED ON ATTRIBUTE

FIG. 4C

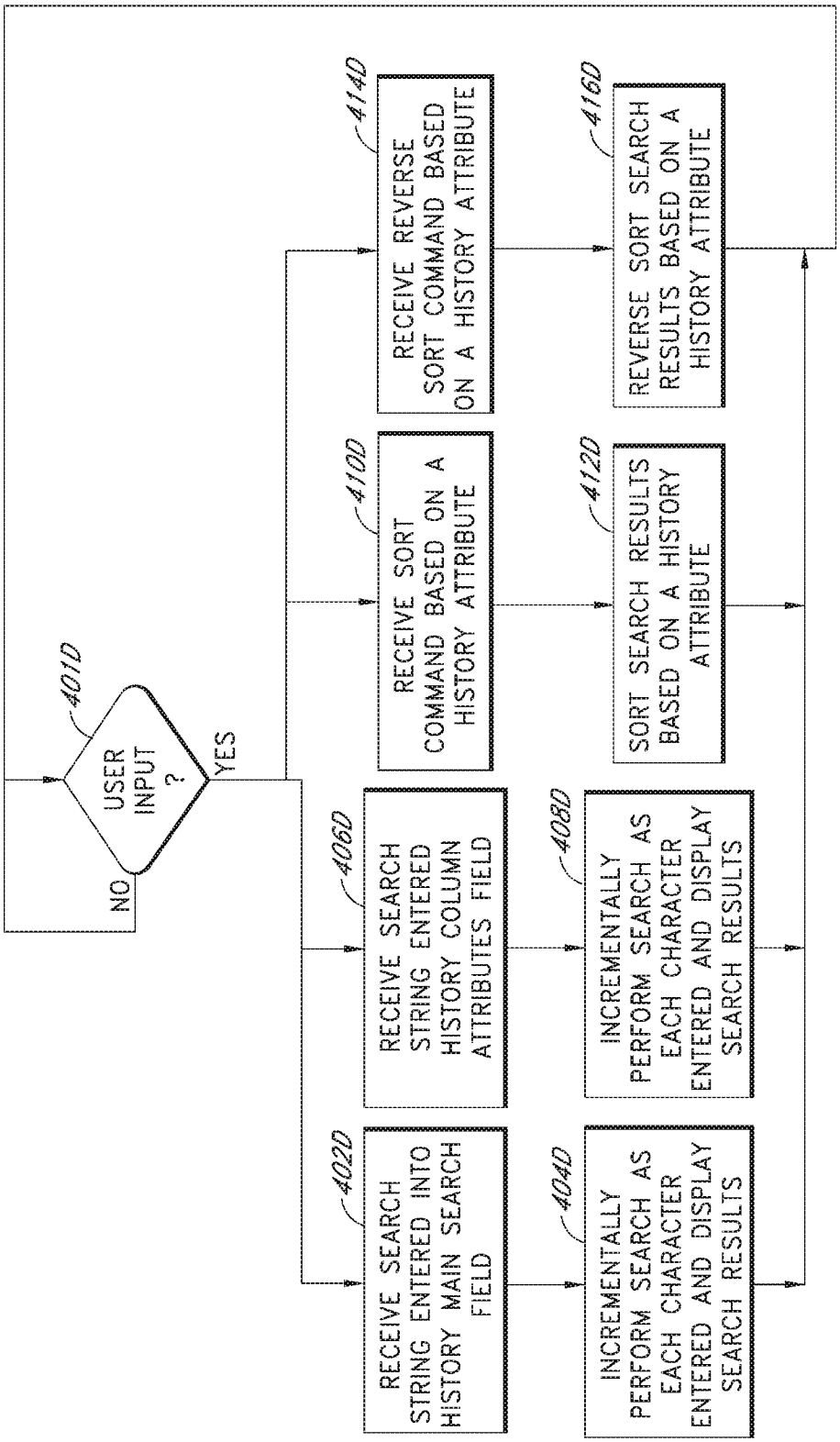
401D
USER INPUT ?
NO
YES
402D
RECEIVE SEARCH STRING ENTERED INTO HISTORY MAIN SEARCH FIELD
404D
INCREMENTALLY PERFORM SEARCH AS EACH CHARACTER ENTERED AND DISPLAY SEARCH RESULTS
406D
RECEIVE SEARCH STRING ENTERED HISTORY COLUMN ATTRIBUTES FIELD
408D
INCREMENTALLY PERFORM SEARCH AS EACH CHARACTER ENTERED AND DISPLAY SEARCH RESULTS
410D
RECEIVE SORT COMMAND BASED ON A HISTORY ATTRIBUTE
412D
SORT SEARCH RESULTS BASED ON A HISTORY ATTRIBUTE
414D
RECEIVE REVERSE SORT COMMAND BASED ON A HISTORY ATTRIBUTE
416D
REVERSE SORT SEARCH RESULTS BASED ON A HISTORY ATTRIBUTE

FIG. 4D

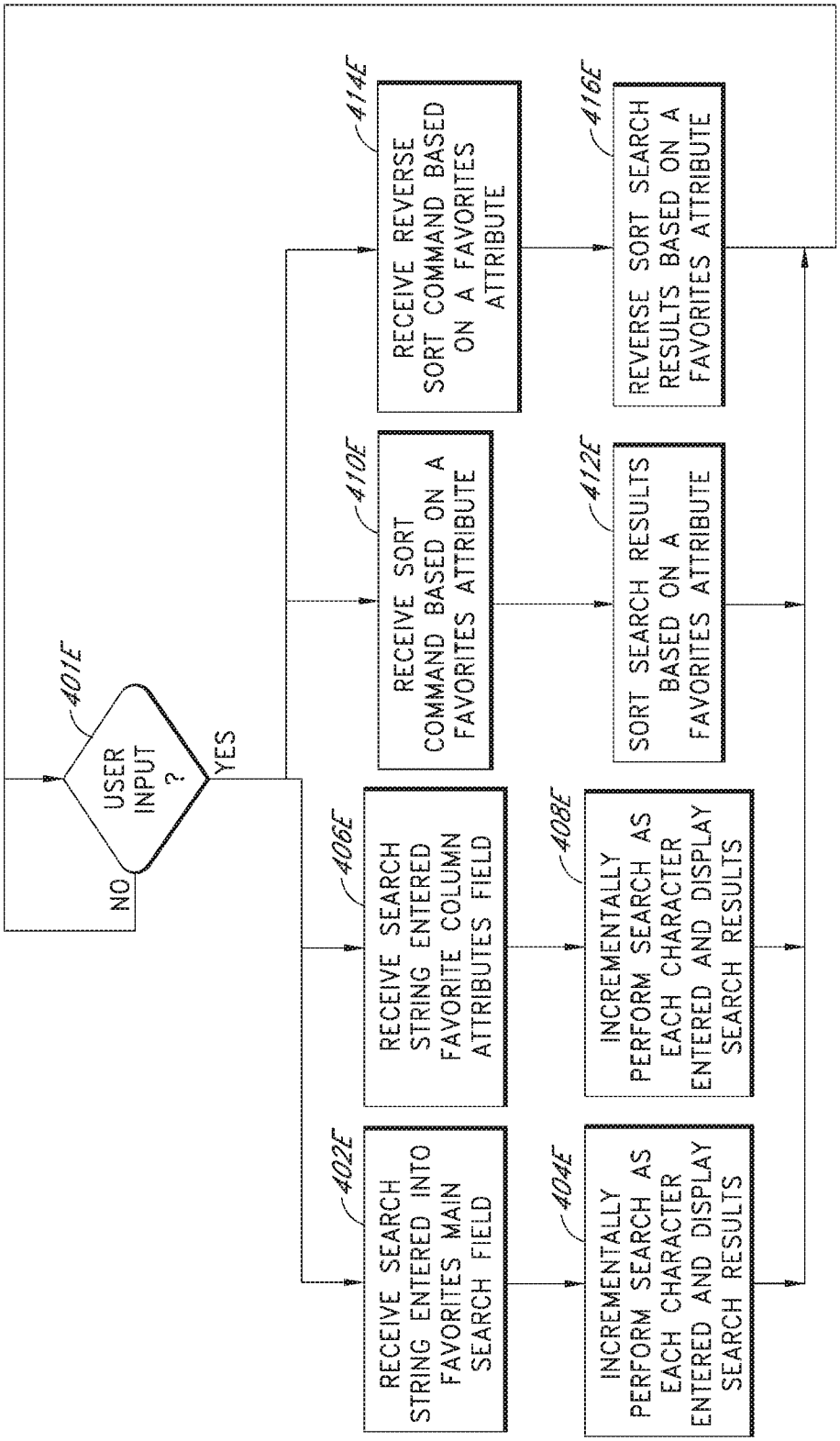
401E
USER INPUT ?
NO
YES
402E
RECEIVE SEARCH STRING ENTERED INTO FAVORITES MAIN SEARCH FIELD
404E
INCREMENTALLY PERFORM SEARCH AS EACH CHARACTER ENTERED AND DISPLAY SEARCH RESULTS
406E
RECEIVE SEARCH STRING ENTERED FAVORITE COLUMN ATTRIBUTES FIELD
408E
INCREMENTALLY PERFORM SEARCH AS EACH CHARACTER ENTERED AND DISPLAY SEARCH RESULTS
410E
RECEIVE SORT COMMAND BASED ON A FAVORITES ATTRIBUTE
412E
SORT SEARCH RESULTS BASED ON A FAVORITES ATTRIBUTE
414E
RECEIVE REVERSE SORT COMMAND BASED ON A FAVORITES ATTRIBUTE
416E
REVERSE SORT SEARCH RESULTS BASED ON A FAVORITES ATTRIBUTE

FIG. 4E

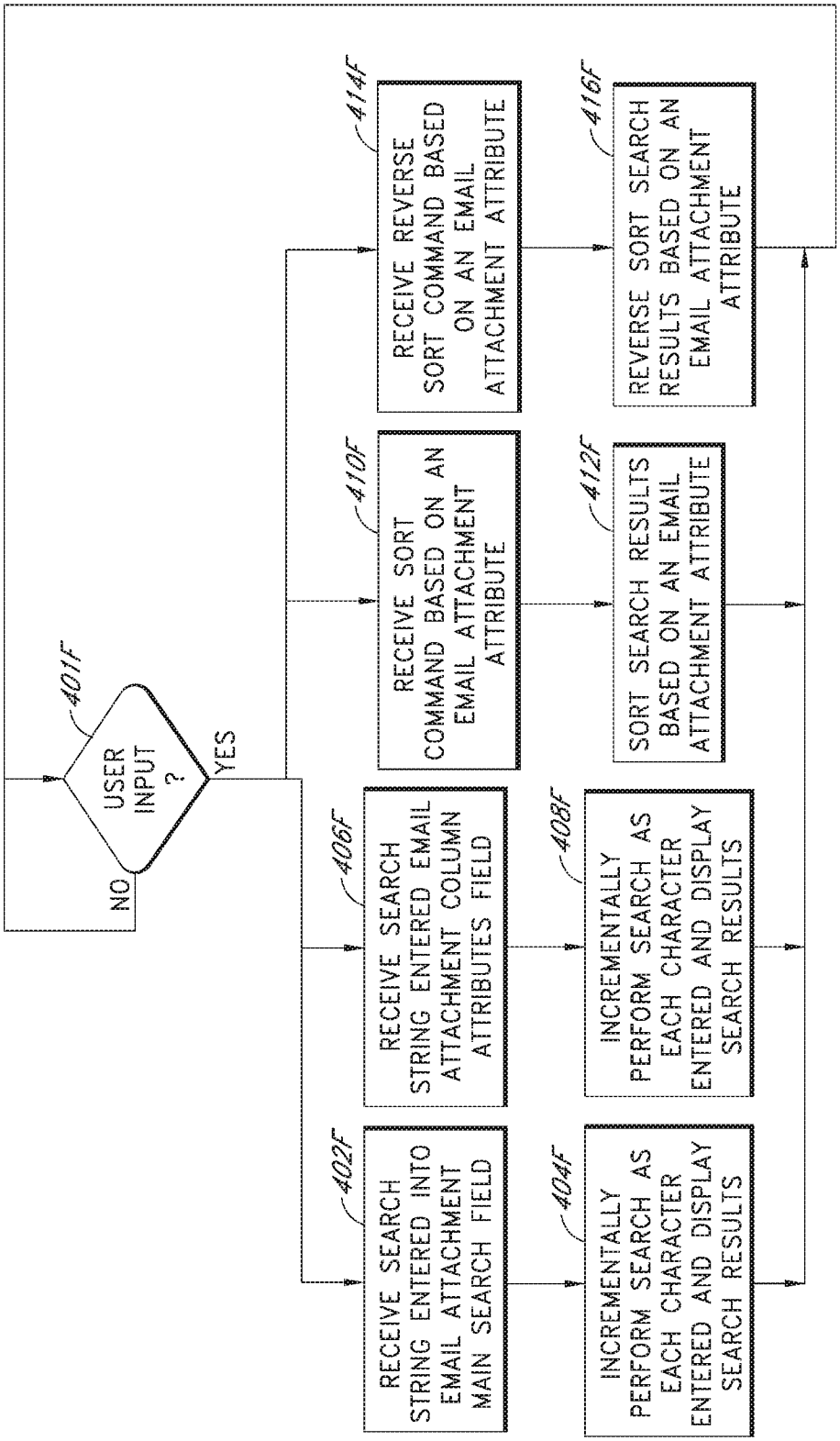
401F
USER INPUT ?
NO
YES
402F
RECEIVE SEARCH STRING ENTERED INTO EMAIL ATTACHMENT MAIN SEARCH FIELD
404F
INCREMENTALLY PERFORM SEARCH AS EACH CHARACTER ENTERED AND DISPLAY SEARCH RESULTS
406F
RECEIVE SEARCH STRING ENTERED EMAIL ATTACHMENT COLUMN ATTRIBUTES FIELD
408F
INCREMENTALLY PERFORM SEARCH AS EACH CHARACTER ENTERED AND DISPLAY SEARCH RESULTS
410F
RECEIVE SORT COMMAND BASED ON AN EMAIL ATTACHMENT ATTRIBUTE
412F
SORT SEARCH RESULTS BASED ON AN EMAIL ATTACHMENT ATTRIBUTE
414F
RECEIVE REVERSE SORT COMMAND BASED ON AN EMAIL ATTACHMENT ATTRIBUTE
416F
REVERSE SORT SEARCH RESULTS BASED ON AN EMAIL ATTACHMENT ATTRIBUTE

FIG. 4F

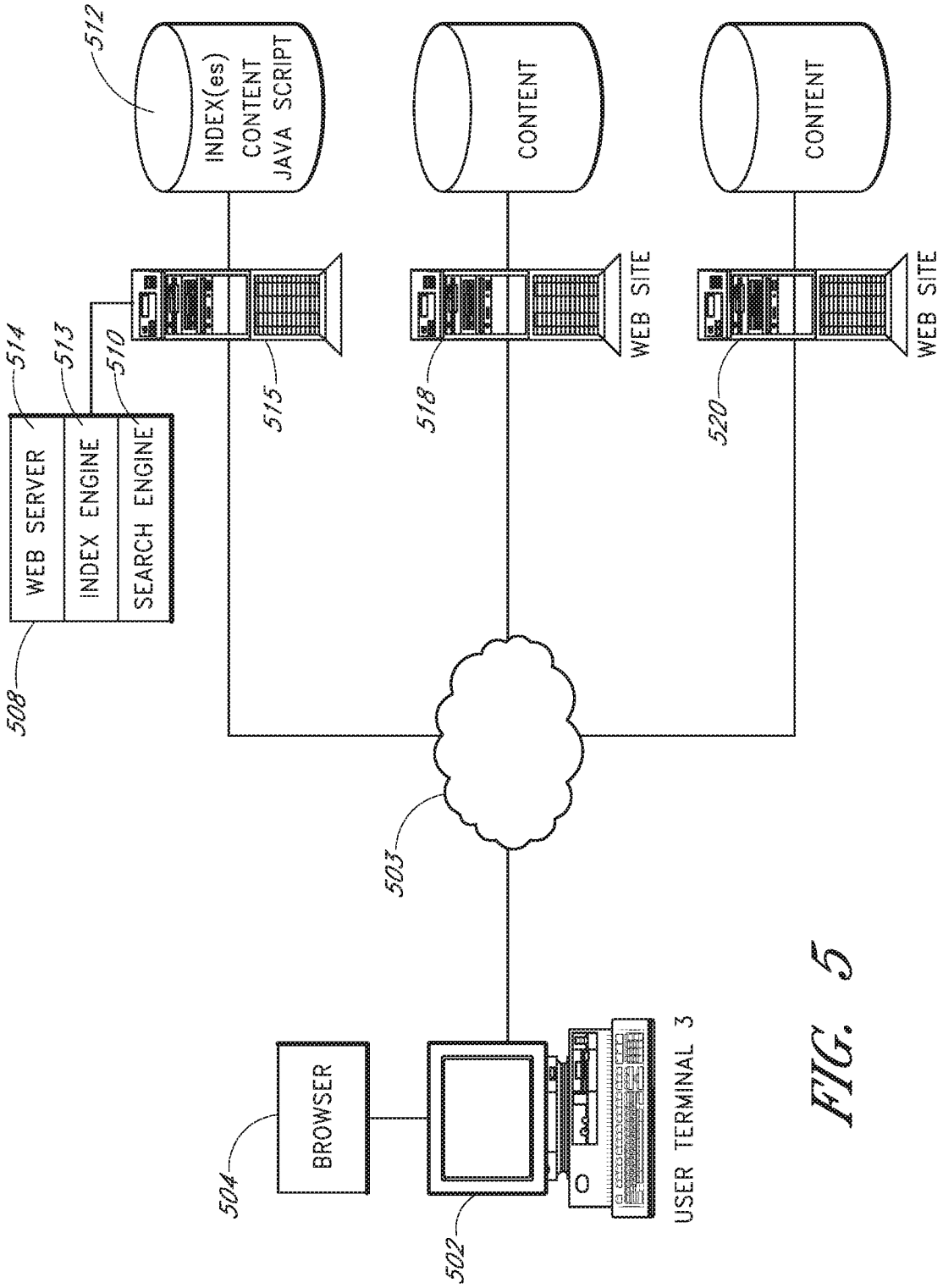
512
INDEX(es)
CONTENT
JAVA SCRIPT
CONTENT
CONTENT
514
513
510
WEB SERVER
INDEX ENGINE
SEARCH ENGINE
508
515
518
520
WEB SITE
WEB SITE
503
BROWSER
504
502
USER TERMINAL 3

FIG. 5

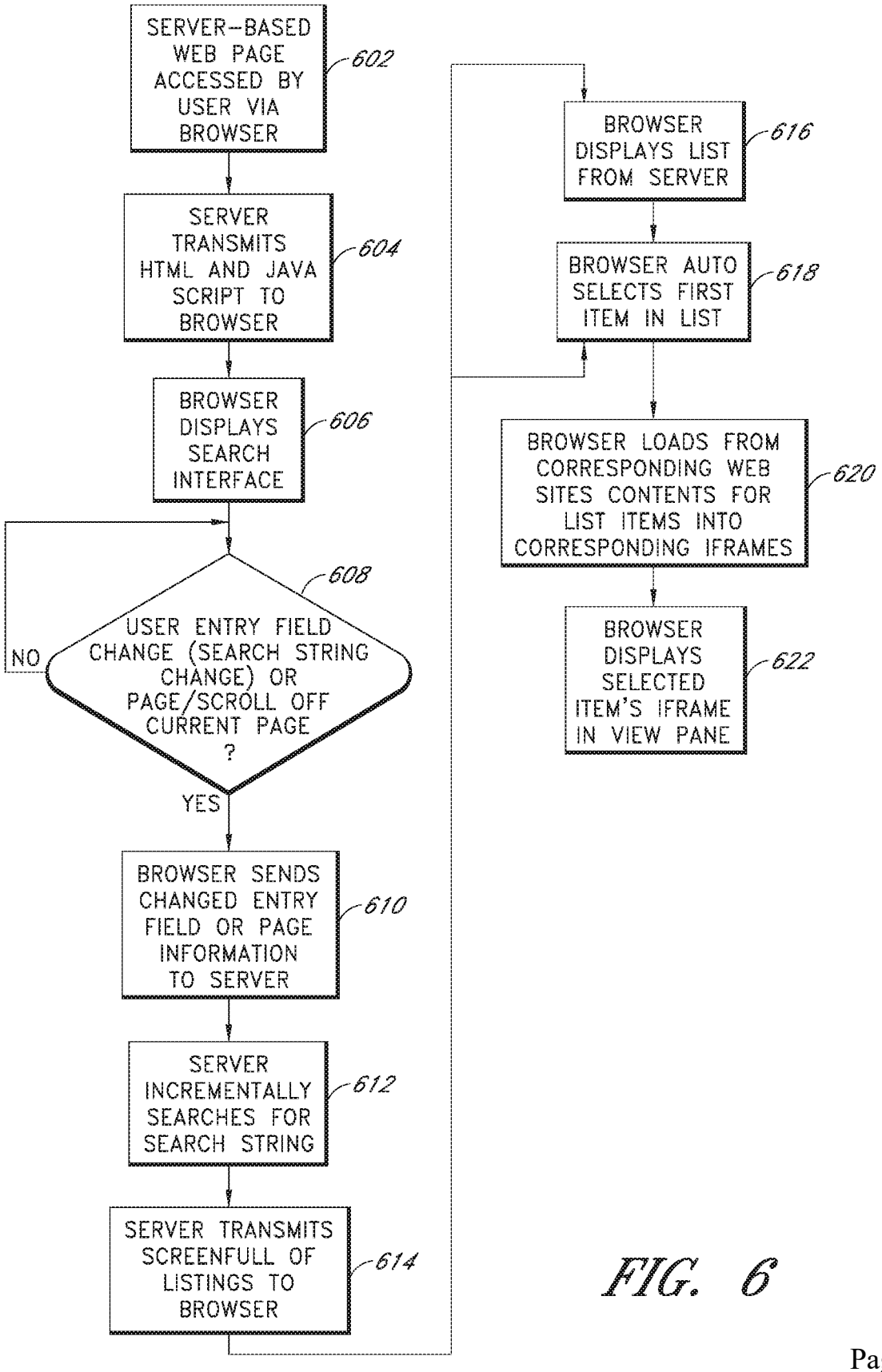
SERVER-BASED WEB PAGE ACCESSED BY USER VIA BROWSER
602
SERVER TRANSMITS HTML AND JAVA SCRIPT TO BROWSER
604
BROWSER DISPLAYS SEARCH INTERFACE
606
USER ENTRY FIELD CHANGE (SEARCH STRING CHANGE) OR PAGE/SCROLL OFF CURRENT PAGE ?
608
NO
YES
BROWSER SENDS CHANGED ENTRY FIELD OR PAGE INFORMATION TO SERVER
610
SERVER INCREMENTALLY SEARCHES FOR SEARCH STRING
612
SERVER TRANSMITS SCREENFULL OF LISTINGS TO BROWSER
614
BROWSER DISPLAYS LIST FROM SERVER
616
BROWSER AUTO SELECTS FIRST ITEM IN LIST
618
BROWSER LOADS FROM CORRESPONDING WEB SITES CONTENTS FOR LIST ITEMS INTO CORRESPONDING IFRAMES
620
BROWSER DISPLAYS SELECTED ITEM'S IFRAME IN VIEW PANE
622

FIG. 6

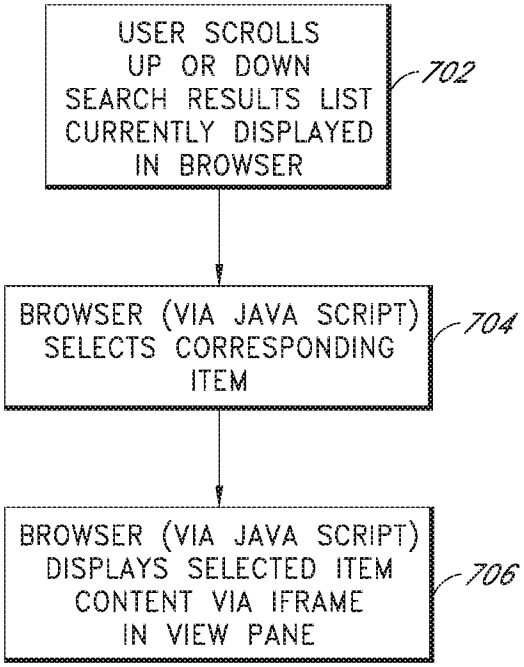
USER SCROLLS UP OR DOWN SEARCH RESULTS LIST CURRENTLY DISPLAYED IN BROWSER
702
BROWSER (VIA JAVA SCRIPT) SELECTS CORRESPONDING ITEM
704
BROWSER (VIA JAVA SCRIPT) DISPLAYS SELECTED ITEM CONTENT VIA IFRAME IN VIEW PANE
706

FIG. 7

METHODS AND SYSTEMS FOR SEARCH INDEXING

PRIORITY CLAIM

[0001] This application is a continuation of U.S. Patent Application No. 14/507,519, filed on October 6, 2014, which is a continuation of U.S. Patent Application No. 11/972,563, filed on January 10, 2008, now U.S. Patent No. 8,856,093, issued on October 7, 2014, which is a continuation of U.S. Patent Application No. 10/654,588, filed on September 3, 2003, now U.S. Patent No. 7,370,035, issued May 6, 2008, which claims priority under 35 U.S.C. § 119(e) to U.S. Provisional Application No. 60/408,015, filed September 3, 2002, U.S. Provisional Application No. 60/413,013, filed September 23, 2002, U.S. Provisional Application No. 60/448,923, filed February 20, 2003, U.S. Provisional Application No. 60/470,903, filed May 14, 2003, and U.S. Provisional Application No. 60/478,960, filed June 13, 2003, each of which is hereby expressly incorporated by reference in their entireties.

Related Applications

[0002] This application is related to U.S. Patent No. 7,496,559, entitled APPARATUS AND METHODS FOR LOCATING DATA, Serial Number 10/654,595, Attorney Docket No. X1.001A, and U.S. Patent No. 7,424,510, entitled METHODS AND SYSTEMS FOR WEB-BASED INCREMENTAL SEARCHES, Serial Number 10/654,596, Attorney Docket No. X1.003A, each of which were filed on the same date as U.S. Patent No. 7,370,035, entitled METHODS AND SYSTEMS FOR SEARCH INDEXING, Serial No. 10/654,588, the entirety of which are hereby incorporated by reference.

Background

Field

[0003] The present invention relates generally to data processing, and in particular to systems and methods for locating data.

Description of the Related Art

[0004] Conventional search application programs often are slow and cumbersome to use. For example, many search engines require the user to type in a search term, click on a search button, and review the results. If the user is not satisfied with the results, as might be the case if too many items or items that are not of interest are found, then the user needs to edit the search terms, click on an initiate search button, and again review the results. In addition, many search application programs only provide for limited search filtering, wherein the user is limited to filtering the search based on dates, file location, and file contents.

[0005] Another drawback of some search engines is that the actual search process takes an annoying amount of time to complete a search. Furthermore, some search engines do not include search features directed to specific types of search targets, such as email, Web pages, and files. Alternatively and inconveniently, separate tools may be needed to search for email, Web pages, and files if the user desires corresponding specific search features.

[0006] Further, with many Web-based search systems, the user types in a search phrase in a Web page search field presented via a browser on the user's computer screen, and then presses an Enter key or Search button to have the query transmitted to a remote server system that will perform the search. The server processes the query, generates a list of search results, and sends the list back to the user's browser. The user then clicks on one of the choices, whereupon a target page is displayed. The process from the time the user starts typing, until the user sees the target page, can take at least 5 seconds, and often takes 30 seconds or more.

[0007] Because of the turnaround time for typing in a search phrase to receiving search results, this conventional search procedure can demand a deliberative and tedious strategy from the user in order to search efficiently. First the user may think carefully regarding what search terms to use, the user then enters the search term, initiates the search, after several seconds receives and reviews the list of results, decides which, if any of the results seem relevant enough to click on, click on a selected list item, wait several seconds for the corresponding

Web page to be returned and displayed on the user's browser, and finally reviews the Web page.

Summary

[0008] One example embodiment of the present invention advantageously provides for incremental or reactive searching of a variety of search targets. For example, the search targets can include one or more of files, emails, email attachments, Web pages, specific databases, and/or the like. Because a search is performed incrementally, the search results are provided or narrowed substantially immediately after each character in a search string is entered by a user. Thus, the user is provided with substantially immediate feedback as the search string is being entered, and so can quickly decide on the desirability of entering additional search characters, entering a new search string, or deleting one or more search string characters.

[0009] An example search application generates one or more indexes corresponding to the search target types. An index optionally includes both content information and attribute information for potential search targets. The attribute information can be specific to the type of search target. For example, the index can include at least partially different attribute information for files as compared to emails. The indexing is optionally performed incrementally.

[0010] One embodiment is a method of performing a search comprising: receiving at least a first search string and a second search string as the first and second search strings are being entered into the same search field; and incrementally locating at least a first document that has a least a first word that begins with the first string and a second word that begins with the second string.

[0011] Yet another embodiment is a search apparatus, comprising: a first instruction configured to read at least a first search string and a second search string entered into a same first search field; and a second instruction configured to incrementally filter search results to locate at least a first document that has a least a first word that begins with the first string and a second word that begins with the second string.

[0012] Still another embodiment is a search index system comprising: scan code that determines at least in part what files to index; index code that indexes files based at least in part on the scan code determination, wherein the index code is further configured to locate punctuation marks in at least a first search string and to treat at least a portion of the punctuation marks as string separators based at least in part on their location within the first search string.

[0013] One embodiment is a method of selectively performing a search and executing a command, the method comprising: receiving at least a first string in a search field; determining if the first string is a command; selectively initiating command execution in response to determining that the first string is a command; and selectively initiating a search if the first string is not a command.

[0014] Still another embodiment is a search apparatus, comprising: a first instruction configured to receive a first string entered into a search field; a second instruction configured to determine if the first string corresponds to a command; a third instruction configured to initiate command execution in response to determining that the first string corresponds to a command; and a fourth instruction configured to initiate a search if the first string is not a command.

Brief Description of the Drawings

[0015] Embodiments of the present invention will now be described with reference to the drawings summarized below. These drawings and the associated description are provided to illustrate example embodiments of the invention, and not to limit the scope of the invention.

[0016] Figure 1 illustrates an example computer system that can be used in accordance with one embodiment of the present invention.

[0017] Figure 2A illustrates an example index architecture.

[0018] Figure 2B illustrates an example search process using the index.

[0019] Figure 2C illustrates an example indexing process.

[0020] Figure 2D illustrates an example use of a pre-computed sort list.

[0021] Figures 3A-I illustrate example user interfaces in accordance with one embodiment of the present invention.

[0022] Figures 4A-4F illustrate example search processes.

[0023] Figure 5 illustrates an example computer system that can be used to provide a server based search system in accordance with one embodiment of the present invention.

[0024] Figure 6 illustrates an example search process using the server based search system.

[0025] Figure 7 illustrates an example process of scrolling through a search list.

[0026] Throughout the drawings, like reference numbers may be used to refer to items that are identical or functionally similar.

Detailed Description of Preferred Embodiments

[0027] Embodiments of the present invention provide systems and methods for searching, index, and presenting information. As will be described in greater detail below, in one example embodiment, a search apparatus provides multiple search fields corresponding to different search target characteristics. As a user enters in a search term into a field, the search results are refined incrementally with each entered character. Thus, the search results are shown as the user enters search characters or terms. To further refine or filter the search results, the user can enter other search terms into other fields. In one embodiment, the filtering process is performed substantially immediately upon the user entering addition search characters or terms.

[0028] Further, a user can incrementally broaden the search results by deleting or backspacing over previously entered search characters. The search results are broadened substantially immediately, in response to the user deleting or back spacing over a character, without requiring that the user click on or otherwise activate a "search" button or the like. A search, for example, can typically take 200 ms or less, though in some situations it can take longer, such as, for example, 300 ms, 400 ms, 600 ms, 1 second, or 2 seconds.

[0029] In one embodiment, a user interface includes a list area or pane, which lists the search results (optionally including headlines or summaries), and a

view area or pane, which displays an item or contents of an item, such as an item selected in the list area. Advantageously, the user can customize an example search system in accordance with the user's preferences.

[0030] Throughout the following description, the term "Web site" is used to refer to a user-accessible server site that implements the basic World Wide Web standards for the coding and transmission of hypertextual documents. These standards currently include HTML (the Hypertext Markup Language) and HTTP (the Hypertext Transfer Protocol). In addition, reference is made to Java script (also referred to as JavaScript), though other types of script, programming languages, and code can be used as well. It should be understood that the term "site" is not intended to imply a single geographic location, as a Web or other network site can, for example, include multiple geographically distributed computer systems that are appropriately linked together. Furthermore, while the following description relates to an embodiment utilizing the Internet and related protocols, other networks, such as networked interactive televisions, and other protocols may be used as well.

[0031] In addition, unless otherwise indicated, the functions described herein are preferably performed by executable code and instructions running on one or more general-purpose computers. However, the present invention can also be implemented using special purpose computers, state machines, and/or hardwired electronic circuits. The example processes described herein do not necessarily have to be performed in the described sequence, and not all states have to be reached or performed.

[0032] Further, while the following description may refer to "clicking on" a link or button, or pressing a key in order to provide a command or make a selection, the commands or selections can also be made using other input techniques, such as using voice input, pen input, mousing or hovering over an input area, and/or the like.

[0033] One example search system provides for incremental searching across a plurality of attribute fields for files, emails, email attachments, the Internet, other networks, prior Internet or other network search results ("history"), favorites, specific databases, and/or the like. In one example embodiment, the search system

includes a client-based search application. Other embodiments can utilize a server-based search application.

[0034] One example search application includes tabs corresponding to an email search interface, a files search interface, a Web search interface, a favorites search interface, an email attachment interface, a Web history search interface, and/or a specific database search interface. Thus, in one example embodiment, a search application provides search specific interfaces for different types of search targets.

[0035] Optionally, all the tabs are efficiently displayed and selectable in a plurality screens. Thus, while viewing a first target search interface, a user can select a different search target interface by moving the cursor over a given tab and then clicking on the tab. In another embodiment, a list of interface links or a drop down menu can be used to select the target specific search interfaces. In addition, other methods of selecting the search target interfaces can be used as well. For ease of use, the different interfaces optionally have similar layouts with respect to the positioning of may of the interface elements, such as the list and view areas, the tabs, and main search field.

[0036] Figure 1 illustrates example hardware and software components on a physical and/or functional level that can be invoked or used when performing a search and/or an indexing operation. As depicted, one embodiment includes a search application 102 stored on and executed by a user terminal 104. As will be described in greater detail below, the search application 102, provides user interfaces for searching email, files, Web sites, cached Web pages, databases and the like. In addition, the search application 102 has a local index engine 103 that indexes email, files, cached Web pages, databases and the like, stored in a data repository or database 105. For example Web pages previously viewed in the search application's view pane or area, and optionally, stored Web pages previously viewed using other user browsers, or otherwise stored locally can be indexed. Separate indexes can be used for the email, files, cached Web pages, databases and the like, or a single index can be used for the foregoing.

[0037] The index engine 103 can further include code configured as a scan engine or module that is used to determine whether a file is to be indexed. Thus, the index engine 103 can also scan files to identify new targets, such as email, document files, Web pages, database entries, and the like, that have not yet been indexed, or targets that have been previously been indexed but have since been modified. Optionally, rather then re-index all corresponding targets each time an index operation is performed, the index engine 103 can incrementally index just the new or modified targets or documents.

[0038] The index engine 103 can utilize one or more indexing algorithms to create an index, such as a reverse or inverted index. The index includes a data structure that associates character strings with files, documents, and the like. In one example embodiment, for each word or character string found with a file or document, the index stores which fields of which documents or files contain that word or character string.

[0039] In one example embodiment, the index is constructed in blocks, which for convenience will be referred to as incremental index bulks or bulks. In this example, there is an incremental index bulk for each indexed target type, such as files, email, favorites, email attachments, stored Web pages. By way of example, a bulk can be 4 Mbytes in size, 16 Mbytes in size, or other sizes. A given bulk can be a memory mapped block of volatile memory, such as DRAM or SRAM, in which list structures for the corresponding index are built. The bulks can be stored on slower mass memory, such as a hard disk drive, and then read into faster RAM upon startup of the search application. Advantageously, having the bulk memory mapped into RAM allows for fast searches and updating, as compared with having to translate the information from a disk storage format to a different RAM format.

[0040] When the bulk fills up so that the allocated memory space for the bulk is filled or substantially filled by the index data, the bulk is stored in non-volatile mass memory, such as a magnetic drive, and is termed a fixed index. The complete index for a given target type can include several fixed indexes and the bulk. As new documents or files are added to the index, they add to the bulk, rather than directly to the fixed

indexes. Optionally, the bulk can be stored in mass, non-volatile memory, such as a hard disk drive, and read into RAM as needed.

[0041] In the example embodiment, when a predetermined number of fixed indexes, such as 5, are created the multiple fixed indexes are optionally merged into a smaller number of indexes, such as single relatively larger fixed index. Advantageously, this permits searches to be completed in relatively less time, as fewer indexes, and optionally only one index, needs to be searched. Search speed is much more closely correlated with the number of indexes that need to be searched, as compared to the size of the index, and therefore it takes less time to search one large file as compared to 5 or 10 other files that are in aggregate the same size as the one large file.

[0042] After a merge process is performed, new items are indexed and added to the corresponding bulk, and additional indexes are stored in non-volatile mass memory, as similarly described above. Generally, the first fixed index is significantly larger than the other fixed indexes, as the first fixed index is the merged composite of previous fixed indexes, while the additional fixed indexes are each one bulk in size.

[0043] In one embodiment, a fixed index can include a plurality of separate files, though in other embodiments, a single file containing the same or equivalent data can be used. For example, a “col" file stores attribute data for the target files corresponding to the index. As will be discussed below, the attributes can be used as search criteria and can be displayed to the user in column format. For example, with respect to email a user interface for searching emails can include a from (sender) attribute column, a to (addressee) attribute column, date/time sent and/or received attribute columns, a folder path attribute column, a client attribute column, a cc attribute column, a size attribute column, and a bcc attribute.

[0044] The fixed index can further include an "occur" file, which is the main inverted index data file. A "occur-offsets" file can also be generated. The occur-offsets file stores pointers into the "occur" file. The fixed index additionally includes a "words" file that comprises a list of the words that occur in the target files. Additionally there is a "deletions" file that lists indexed documents or files that have since been deleted. A “body” file can also be generated which has the document text. The body file content is

used for view pane display when the actual document or document is not available or may become unavailable when the content is needed for display in the view pane. The body file can be particularly useful for more transient files, such as emails. The example bulk includes a words file, an occur file, and an occur offsets file.

[0045] Figure 2A illustrates an example index configuration, though other index configurations, types and structures can be used in other embodiments. Each target type can be associated with its own corresponding set of fixed indexes and bulk. Advantageously, having separate sets of indexes for each target type, search and indexing can be performed faster. However, in other embodiments, the same index or index set can be used for all target types. The example index configuration illustrated in Figure 2A includes three fixed indexes 204A, 206A, 208A stored on mass storage media 202A, which can be, for example a magnetic or optical disk drive. In this example, fixed index 204A is a merged index and is larger than indexes 206A, 208A which are non-merged index. Index 208A is the final index, that is, the index with the most recent additions and/or deletions. The final index 208A includes the information from the bulk 212A. The bulk 212A includes a words file, an occur file, and an occur offsets file. Advantageously, the bulk 212A is stored in RAM 210A so that additions and deletions can be made very quickly, without requiring constant modification of the final index 208A stored on slower mass storage media 204A. Optionally, all the indexes can be read into RAM 210A to increase search speed. Upon shut-down of the search application, the bulk 212A is written back to the index 208A for storage on the non-volatile mass memory media 204A.

[0046] Figure 2B illustrates an example search lookup operation. At state 202B one or more search characters or strings are received. At state 204B the character or character strings are located in the words file. At state 206B the pointer or pointers for the character or character strings in the occur-offsets file are located. At state 208B document-occurrence information is read from the occur file using the located pointers. At state 210B the search results are presented to the user. The search results are displayed in the list pane or area, and the view area or pane displays the contents of the first item or a selected item from the list area.

[0047] Optionally, the content displayed in the view area or pane is auto-scrolled down to the first matching character or character string, which may be highlighted or otherwise emphasized. The search term can be automatically displayed with multiple preceding and succeeding lines or sentences. For example, a search for "matisse" might find a document where the first appearance of "matisse" occurs at the 100th line down. The auto-scroll process automatically scrolls down to, or otherwise displays the content beginning at a certain point relative to the first appearance of "matisse." For example, the content can be displayed in the view pane from line 90 to line 110, substantially immediately upon selecting that page in the list pane, so that the user can immediately see the matching word "matisse" in context. Optionally, the user can specify how many sentences or lines are to be displayed before and after the search term.

[0048] Optionally, the view area or pane displays the content in a collapsed format, so that several matches that are distributed throughout a viewed document can be seen at once, with one or more lines or sentences of context above and below each match displayed as well, and the remaining lines deleted or "collapsed" into ". . ." types of lines, with + symbols for expanding the collapsed section to view that section or the entire document in uncollapsed format, and with – symbols to recollapse a section as desired.

[0049] In one optional embodiment, the index stores "prefix" entries, which further enhances the speed of incremental filtering or searching. For example, in addition to bare or complete words, such as "dog," common prefixes, such as "d" or "do", are stored as well. The "d" prefix entry contains information indicating which documents or files contain a word or character string starting with "d". By preparing this information during indexing, the response for the first letter or two of a filtering or search operation is greatly enhanced as compared to a standard inverted index, which would have to locate thousands of matches at the time of receiving the user query, thereby resulting in slow filtering operations.

[0050] Optionally, a "sort" file is provided for each attribute column. The sort files are cached sort orders for the documents or files in the fixed index, when sorted by that column. In one embodiment, the sort order for each column is pre-computed

before receiving a user sort instruction, so that when the user provides a sort order, such as by clicking on a column header to sort, the sort operation is performed almost instantly, in a few seconds or a fraction of a second, rather than in minutes. Optionally, the sort files can be cached in local RAM to speed up access of the sort files. The user can optionally specify that a particular attribute is to be used as a default sort key when presenting a document list. Thus, for example, the user can specify that as a default sort for email, emails should be automatically sorted and ordered according to date/time received. In this example, the pre-computed default sort list, also referred to as a master sort list, would then be sorted according to date/time, and the master sort list would be almost instantly presented with the pre-computed sort list when the user clicks on the email tab.

[0051] Optionally, a pre-computed sort list for a plurality of documents or files, or for every document or file in a selected search tab or interface is stored in high speed local memory RAM, sorted by the current sort order. The search engine can then search through this list when additional search terms are added. Advantageously, this enables the substantially instant redisplay of a given search result list in the selected order when the search results change as the result of a letter being typed or removed from the filtering phrase. Without the master sort list the incremental filtering might appear to operate much more slowly. In another embodiment, the column information is compressed so that all or a large portion of the column information fits in RAM. The column information can then be sorted using memory-sort algorithms, rather than pre-computing the sort order. In one example embodiment, the column information is compressed using a unique-string dictionary that includes each unique value that occurs in each attribute column file. The attribute column file contains pointers to items within this unique-string dictionary, rather than the strings themselves.

[0052] In one example embodiment, the pre-computed sort list is generated and used as follows. Referring to Figure 2D, a sort process begins at state 202D, where a matching item list is retrieved or accessed from memory. At state 204D certain information in the matching item list is stored using a bit mask that optionally contains a bit for every item in a corresponding master sort list, that is for each indexed item for a

given target type. The bit indicates whether the item in the master sort list is a matching item or not, that is, whether the item is included in the matching item list. For example, each bit can be set to either a "1" to indicate the item is a match, or a "0" to indicate no match. For example, if there are 1,000,000 indexed items in the master sort list, then the bit mask would use 1,000,000/8 bytes = 125k. Advantageously, use of the bit mask often significantly reduces that time it takes to locate matches as a quick bit-check operation can be performed on a given bit mask bit position, rather than necessitating a search through all or a large portion of the master sort list.

[0053] At state 206D the bit for an item in the bit mask is read to determine whether the master sort list item corresponding to the bit is a matching item or not. If the item is a matching item, the process proceeds to state 208D at which the item is added to the sorted list results and the process proceeds to state 210D. Otherwise, the process from state 206D to state 210D. At state 210D a determination is made as to whether the end of the master sort list has been reached. If not, the process proceeds back to state 206D and examines the next bit in the bit mask corresponding to the next item in the master sort list. If the end of the master sort list has been reached, the process proceeds from state 210D to state 212D.

[0054] In one embodiment, a bit mask is generated using the index file information. For example, there can be one bit per document, indicating which documents contain each word in the search phrase. Then Boolean operations (for example, AND, OR, NOT, XOR, etc.) can be used to combine the bit masks for some or all of the fixed indexes, and for some or all the different words or character string, to get a bit mask of the matching results.

[0055] Referring back to Figure 1, the database or repository 105 may be configured as multiple files and/or databases stored on an internal or external storage device of the user terminal 104. A given index can include the item content, and the time, date, item size, or other attributes from when the index entry was created and/or last updated. The some or all of the foregoing index information can be used to determine if a file has been previously indexed or modified since it was last indexed, therefore needs to be indexed or re-indexed.

[0056] The search application 102 further includes a local search engine 107 that utilizes one or more of the indexes created by the index engine 103 to locate email, files, cached Web pages, databases and the like in response to a user query. For example, in response to a query the local search engine 107 accesses the index 105 and locates corresponding matches. The search engine 107 returns excerpts or headlines from relevant matches, and also returns links to the matches. In addition, the search application 102 optionally passes user queries to one or more remote search engines, receives the results, and displays the results to the user. In one embodiment, the search application 102 includes command line code that determines whether a user has entered a command into a search field, and if so, causes the command to be executed. While the search engine 107 and the index engine 103 are illustrated as separate entities, in one embodiment, they are combined in a single engine or module.

[0057] The search application 102 can be downloaded or accessed from a remote Web site, loaded via removable, optical, magnetic, or semiconductor memory, pre-loaded on the terminal's mass storage apparatus, or otherwise stored and/or made accessible to the terminal 104.

[0058] The terminal 104 can be a personal computer, an interactive television, a networkable programmable digital assistant, a computer networkable wireless phone, and the like, that optionally has access to the Internet via a network interface. The terminal 104 can include a display, keyboard, mouse, trackball, electronic pen, microphone (which can accept voice commands), other user interfaces, speakers, semiconductor, magnetic, and/or optical storage devices.

[0059] In addition to the search application 102, the user terminal 104 can run one or more commercially-available Web browser applications 106 such as Microsoft Internet Explorer® or Netscape Navigator®, which implement the basic World Wide Web standards such as HTTP and HTML.

[0060] The terminal 104 can also host and/or execute a commercially available e-mail application 109, such as Microsoft Outlook® which may be used to receive, send, and display emails. The e-mail application 109 and the browser 106 may be integrated with one another, and/or may be integrated with other application programs or the terminal operating system.

[0061] In the embodiment described herein, a Web site 108 hosts a remote search engine 110 executing on a computer system 111. The computer system 111 includes one or more content and index databases 112. The Web site 108 and search engine 110 are accessible to the search application 102 via the Internet 113. The Web site 108 may optionally include content that spans multiple Internet domains, and/or may be implemented using physical servers that are geographically remote from one another. In other embodiments, the Web site 108 may be in the form of an intranet site, in which case the terminal 104 may be coupled to the site by a private network. For example, Web site 108 may be in the form of an internal corporate store site for company employees.

[0062] In other embodiments, the Web site 108 may be replaced with another type of network site. For example, the various services described herein could alternatively be implemented on a hypertextual site or browsing area of an online services network such as America Online® or MSN®, in which case users may access the site using software that implements non-standard document formats and transfer protocols.

[0063] In addition, there can be several independent search engines associated with different Web sites, accessible to the terminal 104 via one or more computer networks.

[0064] As further depicted by Figure 1, the Web site 108 includes a commercially-available Web server application 114. The Web server application 114 accesses databases used to generate Web pages in response to queries from end users, including queries submitted via the search application 102. In addition, the Web server application 114 can respond to the browser's request for a page, and deliver the page to the Web browser 106 through the Internet 113.

[0065] By way of example, the search engine 110 may search server-based databases, such as databases 112, of the full text of Web pages selected from selected Web pages. By way of example, the databases 112 can be generated using a spider or the like that "crawls" the Internet searching for Web pages, which are then stored in the databases 112, and that follow the links in those Web pages to other Web pages, which are then stored in the databases. Because the databases

112, or portions thereof, may have been generated before a user submits a search query, these databases may not be fully current. When the search engine 110 performs a Web search in response to a user query, the search engine returns excerpts from relevant Web pages as stored in a corresponding database, and also returns links to the current version of the Web pages, if such exists.

[0066] In addition, a Web page may be added to the search engine databases 112 by directly entering a URL. Optionally, the URL may be submitted by a user or someone associated with the URL. Once a Web page is stored, the Web page is then indexed by the index engine 113. The indexing process may include Web page text, links, and other content. The index is stored in or in association with the search engine database 112. When a user submit a query or search terms, the search engine 110 searches the index based on the query or search terms, including Boolean terms. The search engine 110 locates matches, and links to the corresponding Web pages are transmitted to the user terminal 104 for display. While the search engine 110 and the index engine 113 are illustrated as separate entities, in one embodiment, they are combined in a single engine or module.

[0067] Optionally, certain types of Web pages and links can be excluded from being indexed. For example, optionally a Web site owner can request that the Web site pages are not to be included in the search engine database.

[0068] In addition the search application 102 includes a search application options form, via which the user can select the search application 102 to be configured in one of a docked mode, docked with auto-hide mode, and a "normal" Windows mode. If docked mode is selected, and assuming the search application 102 has been launched, a portion of the search application interface, such as a control bar, will constantly be visible at a fixed location of the user's display, such as on the top, left, right, or bottom of the user display. The control bar can include the search tabs discussed above, a main search field, a clear entry button, used to clear the main search field in response to a single click or activation, and a "go" button, used to initiate a search in those applications where the actual typing in of the search characters does not initiate the search. For example, when performing a

search over the Internet, the user may optionally need to click on the go button to initiate the search. An example control bar is illustrated in Figure 3I.

[0069] If the docked with auto-hide mode is selected, a portion of the search application interface will be at fixed location of the user's display, wherein the portion will visibly appear as a control bar when the user causes the cursor to point to the portion of the screen where the portion is docked for longer then a predetermined amount of time, such as 0.5 seconds. If the user moves the cursor off the control bar without performing a search, the control bar disappears, freeing screen space for use by other programs. If Windows mode is selected, the search application 102 operates as a conventional Windows program, wherein there is a non-docked, non-autohide window associated with the search application 102.

[0070] The option form also allows the user to set the search application 102 to start in email, files, Web, history, favorites, or database search mode.

[0071] Example search interfaces for different search targets, such as emails, files, the Web, and the like, will now be described. By way of example, the email search fields can include one or more of a content field, a from (sender) field, a to (addressee) field, date/time sent and/or received fields, a folder path field, a client field, a cc field, a size field, a bcc field, and a subject field. An example email search page or form is illustrated in Figure 3A.

[0072] By way of further example, the file search fields can include one or more of a content field, a file name field, a file type field, a date field, a file size field, a path field, an author field, a subject field, and so on. An example files search page or form is illustrated in Figure 3B.

[0073] By way of example, the history search fields can include one or more of a content field, a date/time (last viewed) field, a title field, a size field, a URL field, a format field, a category field, a domain field, a links field, a media type field, a language field, and/or a search term field. An example history search page or form is illustrated in Figure 3D. The Internet search fields can include a content field, a URL field, a title or Web site name field, a size field, a date field, a format field, a category field, a site field, a links field, and a language field, and/or a media type field. The favorites search fields can include one or more of a content field, a URL

or address field, a last refresh field, a title field, and/or the fields discussed above with respect to the Internet search fields. An example favorites search page or form is illustrated in Figure 3E.

[0074] Example email attachment search fields can include one or more of a content field, a name field, a date/time field, a from field, a size field, a MIME tag field, an extension field, and/or path field. An example email attachment search page or form is illustrated in Figure 3F.

[0075] Optionally, incremental indexing can be performed for files, emails, email attachments, Internet (or other network) search results, favorites, specific databases, and/or the like. Incremental indexing can be performed in direct response to a user command, continuously, periodically, and/or upon the occurrence of one or more specified conditions, generates and/or updates a corresponding index. For example, Web pages can be indexed as soon as they are stored or cached. Advantageously, incremental indexing can be used to provide consistently current search indexes.

[0076] For example, with respect to emails an email index can be incrementally updated upon the receipt of new emails, at a specified recurring period (for example, every 60 seconds), at one or more specific times during the day, or when the host computer system is idle. In one embodiment, the host computer system is considered idle when one or more of the following conditions are met: when central processor usage falls below a first threshold; when the host computer bus utilization falls below a second threshold, when a user interface device, such as a keyboard, has not been activated for a first period of time. In other embodiments, different criteria can be used to determine with a computer system is idle. In addition, the user can manually specify that indexing of new email shall be immediately performed, or that all email should be re-indexed.

[0077] By way of further example, with respect to files, a files index can be updated upon the creation, editing, or saving of a file, at a specified recurring period (for example, every 60 seconds), at one or more specific times during the day, or when the host computer system is idle. In addition, the user can manually specify that indexing of new files shall be immediately performed, or that all files should be

re-indexed. An example files incremental indexing options form is illustrated in Figure 3J. Advantageously, the user can optionally specify different indexing trigger conditions for different target types, such as for email and files. In one embodiment, the user can optionally specify different indexing trigger conditions for history, favorites, and attachments as well. Optionally, a server hosting a database can be configured to notify the search application of database changes, and the search application's index engine can index the changes substantially immediately after such notification.

[0078] Advantageously, an embodiment of the search application 102 can be customized by a user to meet the user's particular needs or preferences. For example, the user can select which email application or applications the email search is to be performed in conjunction with. For example, the user can select Microsoft Outlook®, Outlook Express, Netscape® Mail, Eudora® and/or other email applications. In addition, in one embodiment, the user can select one or more Internet search engines to be used in performing a search. As described above, the search engines can be executed by the host computer, or by a remote server. For example, in one embodiment the user can specify the Internet or other network searches are to be performed using one or more of Google™, Teoma™, and AltaVista® search engines.

[0079] With respect to Internet, email, file, or other searches, the user can optionally specify that only search results that are likely to be relevant are to be displayed. For example, if the user requests that only search results that are likely to be relevant are to be displayed, then only the higher ranked search results are displayed to the user. For example, only the top 20, 50, 100, 500, or 1000 search results may be displayed. Relevancy can be determine using one or more techniques, such as whether an exact match is found for the search terms, how many times the search terms are found in a document, the spacing of search terms in a document from each other, Optionally, the relevancy of each found document or file is scored, and the score for one or more of the files or documents are displayed to the user adjacent to the corresponding search results.

[0080] In addition, the user can optionally specify which local and/or network folders are to be indexed. Further, the user can optionally specify, on a global or file-by-file basis, that the file contents and all attributes are to be indexed, or only specified attributes, such as file name and/or size, are to be indexed. The user can also specify, on a global or file-by-file basis, that only certain types of files, or files with certain extensions, are to be indexed. For example, a user can specify that only .txt, .doc, .avi, .pdf., and .mpg are to be indexed.

[0081] Figure 2C illustrates an example indexing process for a given target that can be performed using the indexing/scanning module. As discussed above, the target can be a document, email, file, Web pages, or the like. Optionally, the user can specify that one or more of the following are to be included in the history index and/or search: Web pages located using the Web search interface corresponding to Web tab 310A, Web pages corresponding to the user's favorites, Web pages directly addressed using the address fields on any of the search interfaces, Web pages accessed via a separate browser, such as Microsoft Explorer.

[0082] In this example, the user has specified that indexing is to be performed when the host computer is idle. Beginning at state 202C, an indexing/scanning module determines if the host computer is idle. If the host computer is idle, the process proceeds to state 204C, where the scan process begins. At state 204C index item entries are marked, via a bit or flag associated with a given item, as unseen. As will be discussed below, the "unseen" bit is used to determine if a given item has been deleted and so is to be removed from the index. At state 206C a first item located in an appropriate directory on the mass storage device, which can be a disk drive, is located. At state 208C, because the first item was located, the corresponding index entry is now marked as seen by setting the corresponding flag or bit.

[0083] At state 210C the modification date and time, and/or creation date and time, of a given item is compared to the date and time the index was created or last updated to determine if the file needs to be indexed or re-indexed. For, example, if a file has been modified or created since the last time the index was updated, then those files are to be indexed.

[0084] Optionally, for email files and/or other file types, the indexing/scanning module generates its own "change ID" for each appropriate file. For example, for emails the change ID is generated based on email characteristics or attributes, such as subject, sender name, and/or date. By way of example, and not limitation, the change ID ("uid") can be an aggregate of two or more of the receive time, size, subject, and sender name, as well as the containing folder id, and message-store ID as follows.

[0085] uid = entryid + '|' + fullpathtocontainingfolder + '|' + folderid + '|' + storeid '|' + client.

entryid:
for the Outlook client, entryid = the MAPI entryid.
for other clients, entryid = the "message id" that can be found in the email headers,
and if that's not present, entryid is generated as follows:
entryid = receiveddata + '|' + size + '|' + subject + '|' + sendername

folderid:
for Outlook, folderid = the MAPI entryid of the containing folder
for OE (Outlook Express), use an id from its store
for other email clients, use the full path to containing folder

storeid:
for Outlook, storeid = the MAPI store id of the containing message store
for other clients, storeid is an empty string.

[0086] When performing state 210C during a scan operation, the index module examines the previously calculated change ID for each document or file, generates a new change ID for the documents or files, and compares the previous and new change IDs. If the change IDs are different for a file, then that file will be re-indexed.

[0087] At state 212C, the new and/or modified item indexed or re-indexed. At state 214C a determination is made as to whether there are additional items in the appropriate disk directories. If there are, the process proceeds from state 214C to state 206C, where the index process is repeated for the next item. Once all items have been indexed, the process proceeds to 216C. The index item entries are examined to determine if any of the entries are still designated as unseen, indicating

that the item was not found during the scan and index process. If the item is designated as unseen then it is inferred that the item has been deleted, and those unseen items are deleted from the index.

[0088] As illustrated in Figure 3A, one example search application interface includes a control bar 302A, including search mode tabs for files 304A, email 306A, email attachments 308A, the Internet World Wide Web ("Web") 310A, prior Web search results ("History") 312A, and favorites 314A. There is also an options button 316A that, if selected, provides the user with a variety of forms that allow the user to customize the search application 102 in accordance with the user's preferences and needs. In addition, there is a help button 318A, and a suggestion button 320A, which can be activated when the user wants to submit a suggestion regarding the search application 102 or improvements thereto. Advantageously, having the suggestion button 320A located on a main interface makes it more likely users will provide helpful suggestions, as compared to having such a suggestion button located on a buried menu or rarely accessed interface.

[0089] The tabbed interfaces can have a main search field 322A, wherein the user can enter a search string of one or more alphanumeric characters. The main search field is used to search for a string corresponding to one or more of the search fields associated with the search mode, and optionally other attributes. Thus, for example, with respect to the email tab 306A, the search application 102 will incrementally search for the main search field string in the email contents, from (sender) field, to (addressee) field, date/time sent or received fields, folder path field, client field, cc field, size field, and bcc field.

[0090] As illustrated in Figure 3A, the search results are displayed in a list area or pane 324A, which includes a list of the search results, including relevant attributes in column format. In the example illustrated in Figure 3A, the attributes include a from (sender) attribute column, a to (addressee) attribute column, date/time sent and/or received attribute columns, a folder path attribute column, a client attribute column, a cc attribute column, a size attribute column, a bcc attribute column, and a subject field. In this example, each of the columns has a corresponding search field 330A-348A.

[0091] In addition, a view area or pane 326A is provided that displays the content of the first item or user-selected item from the list pane or area 324A. The user can print the search results displayed in the list pane or area 324A, as well as the document, email, Web page, file, and the like, displayed in the view pane or area 324A.

[0092] Further, when the user clicks on a list pane entry, the corresponding contents are displayed in the view pane 326A. If the user double-clicks, or presses the Enter button, on the list pane entry, the search application causes the entry to launch in its native application. For example, if the user double-clicks on a list pane entry corresponding to a Word file, the file will open in Word. Similarly, if the user double-clicks on a Web page entry in the list pane 324A, the Web page will open in the user's default browser. If the user double-clicks an email entry, the email will open in the user's default email application, such as Microsoft Outlook®.

[0093] The user can also open the folder containing a file listed in the list pane by right-clicking on the file name in the list area 324A and selecting "View Folder". Similarly, the user can open the folder containing an email listed in the list area 324A by right-clicking on the email name in the list pane and selecting "Locate On Disk". The user can right-click to mark email listed in the list area 324A as read or unread by using the corresponding "mark read" or "mark unread" buttons at the top of the view area 326A. Further, the user can activate the plus and minus keys (+/-) to move from one highlighted search term to the next (or previous) in the view area 326A.

[0094] In one embodiment, the user can adjust the width of the list and view areas or panes 324A, 326A by dragging a divider bar 328A located between them to the left or right. In addition, rather than having the list and view areas 324A, 326A visually joined, the list and view areas 324A, 326A can optionally float separately from one another, and the user can separately drag the areas as desired on the user's display device. The user can move up, down, and between the list and view panes 324A, 326A using appropriate controls, such as, by of example, up,

down, left, right arrow buttons, the tab button, and/or the PgUp (page up) and PgDn (page down) buttons.

[0095] In addition, the user can adjust the column widths in the list pane or area 324A by dragging a corresponding column side. Further, the user can reorder the column placement by grabbing a corresponding column header, using, for example, the left mouse button, and then dragging the column to a new location. Optionally, the user can also delete columns. The user can cause the system to reverse a search sort order by clicking on a user selected column header.

[0096] Example searches will now be described. The searches can be performed using an index, such as that illustrated in Figure 2A, and using the search process as similarly described above with respect to Figure 2B.

[0097] By way of example, in order to perform an email search, a user can click on the email tab 306A and bring up the email search interface page, illustrated in Figure 3A. As illustrated in Figure 4A, at state 401A the search system waits for a user input. The user input can be, for example, a search character string or strings entered into the main search field 322A, a search character string or strings entered into an attribute search field, a sort command, or an inverse sort command. The search character or strings can include one or more alpha characters, numeric characters, words and/or phrases that appear in the email contents, from (addresser) field, to (addressee) field, date/time sent or received fields, folder path field, client field, cc field, size field, a bcc field, and a subject field of the email(s), that the user is searching for.

[0098] If the user has entered one or more characters or strings into the main search field 322A the process proceeds to state 402A where the search string is received. The characters or strings can be typed in one at a time by the user or a string or strings of multiple characters can be pasted in with a paste operation. Proceeding to state 404A, a search is incrementally performed using each entered character by the search application's local search engine, and the list pane or area 324A displays incrementally narrowed down search results. Thus, states 402A and 404A take place at almost the same time. For example, state 404A may take place a fraction of a second or a very few seconds after state 402A. Similarly, a user can

incrementally broaden the search results by deleting or backspacing over previously entered search characters. The search results are broadened substantially immediately in response to the user deleting or back spacing over a character, without requiring that the user click on or otherwise activate a "search" button or the like.

[0099] If the user entered one or more characters or strings into one or more corresponding column fields 330A-348A the process proceeds from state 401A to state 406A where the search characters or strings are received. For example, if the user is looking for an email that was received in April of 2003, the user can enter"2003-04" or a portion thereof into the date/time field 332A. At state 408A, as the user enters characters into a column search field, the search is further incrementally performed by the search application's local search engine, and the list pane or area 324A displays incrementally narrowed down search results. Thus, the user can enter or delete search terms in the search fields above each of the attribute data columns to incrementally limit or broaden the results based on matches in that column for the search term entered. The search is performed using the email index, including bulk and fixed indexes.

[0100] The user can optionally select a highlight process, wherein search terms will be highlighted in the list pane or area search results and/or in the view pane or area content display. The highlighting can be in the form of a different coloring, the use of different fonts, blinking text, and/or the like.

[0101] At state 410A, by clicking on an appropriate column header, the user can command the system to sort the search results based on a selected column. For example, the user can click on the Size header to sort the results based on size. The sort can have been pre-computed as similarly described above so that the sort can be immediately displayed. At state 412 the search results are accordingly sorted. In one embodiment, the default sort orders displays the smallest size email first and the largest size email last.

[0102] At state 414A, clicking on the column header a second time reverses the sort order displayed to the user. For example, if the user believes that

the email being searched for is large in size, the user can click on the Size column header so that the larger files are displayed at the top of the column.

[0103] Figures 3G-H illustrate the email search interface during two different stages of an incremental search. The main search field 322A has the character string "2003-0" entered, the from field 330A has the character string "KU" entered, and folder field 334A has the character string "IN" entered, and the to field 338A has the character string "KM" entered with the NOT argument (-) preceding it. The search engine has narrowed the emails listed in list pane or area 324A to the twelve that have the character string "2003-0" in any of the emails' attributes or content, have "KU" in the from field, are located in a folder having the character string "IN" in the folder name, and that does not have the character string "KM" in the to field. The character strings are identically entered in Figure 3H, except the character string ("2003-07") entered in the main search field 322A now has one additional search character (a "7"). Substantially immediately after the "7" was entered, the search application incrementally narrowed the number of emails listed in the list pane 324A from the twelve illustrated in Figure 3G to the four emails listed in Figure 3H.

[0104] By way of further example, in order to perform a file search, a user can click on the file tab 304A and bring up the files search interface page, illustrated in Figure 3B. As illustrated in Figure 4B at state 401B the search system waits for a user input. The user input can be, for example, a search character string or strings entered into the main search field 322A, a search character string or strings entered into an attribute search field, a sort command, or an inverse sort command. If the user entered search characters or strings into the main file search field 306B, the entry is received at state 402B. For example, the entry can include one or more of alpha characters, numeric characters, words and/or phrases that appear in the file contents, the file name, the file type, the file modification date field, the file size, or the file path. At state 404B, as the user enters characters into the main search field the search is incrementally performed by the search application's local search engine, and the list pane or area 308B displays incrementally narrowed down search results.

[0105] If the user has entered one or more characters or strings into one or more corresponding column attribute fields the process proceeds from state 401B to state 406B where the search characters or strings are received. For example, the user can provide a relevant string of characters in a corresponding column attributes field, such as a file name field 312B, a file type field 314B, a date field 316B, a file size field 318B, and a path field 320B. By way of example, if the user is looking for a document located in a "Documents" file on the user's computer "C" drive, the user can enter "C: Documents" or a portion thereof in the path field 320B. At state 408B, as the user enters characters into a column search field, the search is further incrementally performed by the search application's search engine, and the list pane or area 308B displays incrementally narrowed down search results. The search is performed using the file index, including corresponding bulk and fixed indexes.

[0106] At states 410B, 412B by clicking on an appropriate column header, the user can command the system to sort the search results based on a selected column. For example, the user can click on the Size header to sort the results based on size. In one embodiment, the default sort order displays the smallest size file first, and the largest size file last. At states 414B, 416B clicking on the column header a second time reverses the sort order displayed to the user. As discussed above, the search terms can optionally be highlighted in either or both the list pane or area 308B and the view pane or area 310B.

[0107] When searching the Internet and/or Web sites, a user can click on the Web site tab and bring up the Web search interface page, illustrated in Figure 3C. As illustrated in Figure 4C, at state 402C, the user enter a search query into a main search field 304C, including alpha characters, numeric characters, words and/or phrases that the user wants to search for in the Web site contents, the Web site name, and/or the Web site URL. At state 404C, the user initiates the search, such as by activating the "Go" button or pressing the Enter button and the initiation command is received by the search application.

[0108] At state 406C, the query is transmitted over a network, such as the Internet, to one or more search engines, such as Google™, Teoma™, and AltaVista®, which perform searches in parallel based at least in part on the user

entry. At state 408C, the search results from the one or more search engines are returned to the search application, and the search results are displayed in the list area or pane 306C and the Web page contents of a selected or highest ranked search result is displayed in the view pane or area 308C. Optionally, some or all of the Web pages corresponding to the search results are pre-cached on the user's terminal 104 or on other storage local to the user. For example, the Web pages of the first twenty (or other predetermined quantity) listed search results can be pre-cached. In one embodiment, the maximum number of pre-cached Web pages corresponding to the search results is set to be equal to the number of search results that can be displayed in the list pane.

[0109] At state 410C the search system waits for a user input. The user input can be, for example, a search character string entered into the main search field, a search character string entered into an attribute search field, a sort command, or an inverse sort command. If the user entered search characters or strings into the main file search field, the entry is received at state 412C. At state 414C, as the user enters characters into the main search field the search is incrementally performed by the search application's local search engine, and the list pane or area 308B displays incrementally narrowed down search results.

[0110] At state 416C, the user can narrow the search results displayed by entering a relevant string of characters in a corresponding column attributes field. The illustrated example includes a "results" column field 310C that can be used to search for all indexed attributes and/or content. Other embodiments can include additional or different columns and fields, such as a URL column and field, a title or Web site name column and field, a size column and field, a date column and field, a format column and fields, a category column and field, a site column and field, a links column and field, and a language column and field, a media type column and field corresponding to the type of media used on the page, and/or the like.

[0111] The format field and column are used to search for and categorize pages according to the page or document type and/or extension. For example, the format can be a Word document (.doc), an Acrobat document (.pdf), or a PowerPoint document (.ppt). The site field and column are used to search for and categorize

pages according to a Web sites top-level domain name (for example, www.zzzzzzz.com).

[0112] The category field and column are used to search for and categorize pages according to their genre or type, which can have descriptive labels such as "hubs", "personal home page", "commercial", and/or the like. The search system can examine certain Web page and site characteristics during the crawling of the Internet or thereafter, and based at least in part on those characteristics, identify the Web page as belonging to one or more categories. If the categorization is performed before a user requests a search, a user search request, including a category term, can be performed much faster than if the categorization was performed at the time of, or in response to the user search request.

[0113] For example, the category “hubs” or “directory” can correspond to Web pages that have many different links to other Web pages. In addition to the quantity of links, the quality of links can also be taken into account by the search system in categorizing a Web page as a hub or directory. The quality of the links can be scored based on a variety of parameters, including the number of different domains the links link to, how many links are alive or broken (a broken link is a hyperlink that does not work), and/or other parameters. Thus, for example, in one embodiment, the higher the number of different domains the links link to and/or the greater the number or percentage of alive links, the higher the quality score. If the score exceeds a predetermined threshold, the search system will categorize the page as a hub page.

[0114] With respect to the “personal home page” category, by way of example, the search system can look for certain key words or phrases, such a “family,” “children,” and/or “personal home page.” In addition, the search system can determine how many pictures or JPEG files are on the page, and the level of sophistication of the HTML or other formatting code used to create the page. Thus, for example, based on the number of key words, the number of pictures, and/or the sophistication of the HTML code, a determination is made as to whether a page is likely to be a personal home page. In one embodiment, the greater the quantity of personal-oriented key words and pictures, and the lower the code sophistication (for

example, the absence or low level of script files, in line IFRAMES, custom tags), the greater the likelihood that the page is a personal web page. A score can be assigned by the search system based on such properties, and if the score exceeds a predetermined threshold, the search system will categorize the page as a personal home page.

[0115] With respect to the "commercial" or business category, by way of example, the search system can look for certain key words or phrases, such a "price," "quantity," "stock," "ship," "corporation," and/or "shopping cart." In addition, the search system can determine the level of sophistication of the HTML or other formatting code used to create the page. For example, the greater the use of script files, in line IFRAMES, custom tags, and the like, the greater the probable sophistication of the code. By way of example, based on the number of key words and/or the sophistication of the HTML code, a determination is made as to whether a page is likely to be a commercial or business page. In one embodiment, the greater the quantity of business-oriented key words, and the greater the code sophistication, the greater the likelihood that the page is a commercial or business web page. A score can be assigned by the search system based on such properties, and if the score exceeds a predetermined threshold, the search system will categorize the page as a commercial or business web page.

[0116] With respect to the links category, by way of example, the search system can rank pages based on the number of links and/or the quality of links that contain the search characters or strings. For example, if the user was interested in searching for information on Idealab, the user can enter the term Idealab in the links field, the greater the number of links a page has to the Idealab.com domain, the higher the search ranking. By way of example, the quality of the link can be based on how many links are alive or not broken and/or the quality of links on the linked pages.

[0117] At state 418C, as the user enters characters or strings into one or more column search fields, the search results displayed to the user are incrementally limited to those that contain the characters or strings entered by the user. In one embodiment, this narrowing process does not need to access remote

search engines, as the search result information and Web pages are already cached locally. At state 420C, by clicking on an appropriate column header, the user can command the system to sort the search results at state 422C based on a selected column. At state 424C, clicking on the column header a second time reverses the sort order displayed to the user at state 426C.

[0118] The user can optionally print the information contained in the list pane or area 306C, as well as the Web pages displayed in the view pane or field 308C. In addition, the user can enter a Web address directly in the Address Field in the address field 312C, and then press the keyboard Enter button or the displayed Go button 312C to go to that page. As described below with respect to the favorites function, the user can cause the search application to add the address or URL to the user's favorites list by activating the plus (+) button 320C. Advantageously, the user can navigate through the found Web pages using the Forward and Backward control buttons 314C, 316C, and can refresh a Web page using a Refresh button 318C. The Backward control is configured to navigate to a previously viewed favorites Web page and the Forward control is configured to navigate a next favorites Web page.

[0119] To search the results or history of prior Internet and/or Web searches, a user can click on the History tab 312A and bring up the history search interface page, illustrated in Figure 3D. The history process copies Web sites visited by the user, and indexes content and attributes for substantially instant searching of those historical Web pages. When the History interface is presented to the user, stored Web pages previously viewed in the search application's view pane or area 308D, and optionally, stored Web pages previously viewed using other user browsers, are listed in the history list pane or area 306D. Optionally, based on a user-selected option, the view pane or area 308D either shows page corresponding to a select item as the user saw it when on the date/time it was added to the history or the most recent version of the page in Internet Explorer's cache. These pages can be displayed in the view pane or area 308D even when the user is offline.

[0120] As illustrated in Figure 4D, at state 401D the search system waits for a user input. The user input can be, for example, a search character string

entered into the main search field, a search character string entered into an attribute search field, a sort command, or an inverse sort command.

[0121] At state 402D, alpha characters, numeric characters, words and/or phrases, such as those that may appear in the Web page contents, the Web site name or title, the Web page URL, the Web page size, the page category, the page domain, the page language, the links on the page, the data/time the Web page was last viewed, the search terms entered when the Web page was originally located by the search application, the name of the browser or other tool used to originally locate the Web page, and/or the media type used on the page that are entered by the user into the main search field 304D are received.

[0122] At state 404D, as the user enters characters into the main search field 304D the search of the listed items is incrementally performed by the search application's search engine, and the list pane or area 306D displays incrementally narrowed down search results. The view pane or area 308D displays the selected page. The user can optionally specify whether the view pane or area 308D will display the stored Web page, as the user saw it when the Web page was added to the history, or the most recent version of the page stored in a local cache, such as Microsoft's Internet Explorer's cache. Because, in one embodiment, the Web pages are cached, the previously viewed Web pages can be displayed in the view pane or area 308 even when the user's terminal is offline.

[0123] The user can also provide a relevant string or strings of characters in a corresponding column field to specify certain search result attributes, such as a content field, a date/time (last viewed) field 310D, a URL field, 312D, a title field 314D, a size field 316D, a media type field (not shown), a search term field 318D, and/or the browser originally used field (not shown), a Web page size field, a page category field, a page domain field, a page language field, and a links field, which are received at state 406D. At state 408D, as the user enters characters or strings into a column search field, the search is further incrementally performed by the search application's search engine, and the list pane or area 306D displays incrementally narrowed down search results. At states 410D, 412D, by clicking on an appropriate column header, the user can command the system to sort the search

results based on a selected column. At states 414D, 416D clicking on the column header a second time reverses the sort order displayed to the user.

[0124] Optionally, the size of the history index can be limited based on size or date, which can be specified by the user. In one embodiment, the history functionality can integrated with the Web search tab, so that a user can search his/her history directly from the Web tab in addition to live Web searches. Optionally, the user can also enter a URL or address into the address field 320D to browse to a new URL and have that page added to the history. As described below with respect to the favorites function, the user can cause the search application to add the address or URL to the user's favorites list by activating the plus (+) button 322D.

[0125] With reference to Figure 3E, the favorites function is used to select and display Web pages that the user often refers to and so wants to access quickly. The user can select an add favorites button, such as the plus (+) symbol in the history or Web interfaces, as illustrated in Figures 3C and 3D, above a Web page to cause the search application to add it to the user's favorites. In addition, the user can enter the desired address or URL of a Web page into address field 316E, and click the plus (+) button 318E to add the address to the user's favorites list, or click the minus (-) button 320E to remove the address displayed in the address field 316E from the user's favorites list. The Web pages included in the user's favorites are cached, attribute and content indexed, and once indexed, instantly searchable.

[0126] To search the cached favorites Web pages, a user can click on the favorites tab 314A and bring up the favorites search interface page, illustrated in Figure 3E. In response to the user selecting the favorites search mode, user favorites are listed in the favorites list pane or area 306E. The view pane or area 308E either shows that page as the user saw it when on the date/time it was added to the favorites or the most recent version of the page in Internet Explorer's cache. These pages can be displayed in the view pane or area 308D even when the user is offline.

[0127] As illustrated in Figure 4E, at state 401E the search system waits for a user input. If the user provides an entry into a main search field 304E, such as

alpha characters, numeric characters, words and/or phrases that the user thinks may appear in the favorites Web page contents, the Web site name or title, and/or the Web page URL, the entries are received at state 402E. At state 404E, as the user enters characters into the main search field 304E the search is incrementally performed by the search application's search engine, and the list pane or area 306E displays incrementally narrowed down search results. The view pane or area 308E displays the selected page. The user can optionally specify whether the view pane or area 308E will display the stored Web page, as the user saw it when the Web page was added to the favorites, or the most recent version of the page stored in a local cache, such as Microsoft's Internet Explorer's cache. Because, in one embodiment, the Web pages are cached, the previously viewed Web pages can be displayed in the view pane or area 308 even when the user's terminal is offline.

[0128] The user can also provide a relevant string of characters in a corresponding column field, to specify certain search result attributes, such as a content field, a date/time (last viewed) field 310E, a URL field, 312E, a title field 314E, a size field 316E, a media type field (not shown), a search term field 318E, and/or the browser originally used field (not shown), a page category field, a page domain field, a page language field, and a links field, which are received at state 406E. At state 408E, as the user enters characters into a column search field, the search is further incrementally performed by the search application's search engine, and the list pane or area 306E displays incrementally narrowed down search results. At states 410E, 412E, by clicking on an appropriate column header, the user can command the system to sort the search results based on a selected column. At states 414E, 416E clicking on the column header a second time reverses the sort order displayed to the user.

[0129] With reference to Figure 3F, the attachment function is used to locate email attachments. To search for email attachments a user can click on the attachments tab 308A and bring up the attachments search interface page which lists attachments in the attachments list pane or area 306F. As illustrated in Figure 4F, at state 401F the search system waits for a user input. The user can enter into a main search field 304F, alpha characters, numeric characters, words and/or phrases

that the user thinks may appear in the desired attachment contents, name, date/time created, date/time received, from (sender) field, size, MIME tag, extension, and/or path, which are received at state 402F.

[0130] At state 404F, as the user enters characters into the main search field 304F the search is incrementally performed by the search application's search engine, and the list pane or area 306F displays incrementally narrowed down search results. The view pane or area 308F displays the selected page.

[0131] The user can also provide a relevant string of characters in a corresponding column field to specify certain search result attributes, such as a content field (now shown), a name field 310F, a date/time field 312F, a from (sender) field 314F, a size field 316F, a MIME tag field 318F, an extension field 320F, and/or a path field 322F which are received at state 406F. At state 412F, as the user enters characters into a column search field, the search is further incrementally performed by the search application's local search engine, and the list pane or area 306F displays incrementally narrowed down search results.

[0132] At states 410F, 412F, by clicking on an appropriate column header, the user can command the system to sort the search results based on a selected column. At states 414F, 416F clicking on the column header a second time reverses the sort order displayed to the user.

[0133] In one embodiment, a search interface page includes a selection menu that specifies which of email, attachments, files, the Web, favorites, and/or history (previously accessed and stored Web pages) targets, are to be searched. In accordance with the user selection one or more of the email, attachments, files, the Web, favorites, and/or history, or corresponding indexes will be searched. In this embodiment, the column attribute search fields optionally will correspond to the selected search targets. Thus, for example, if the user selects both email and files as search targets, the column attribute fields can include one or more of a from (sender) field, a to (addressee) field, date/time sent and/or received fields, a email folder path field, a client field, a cc field, a size field, and a bcc field, wherein the foregoing fields are appropriate for email searches, and one or more of a file name

field, a file type field, a date last modified or created field, a file size field, and a file path field.

[0134] The search application 102 optionally ignores punctuation of a first set of punctuation when indexing and performing a search, such as an email or files search, and includes punctuation of a second set of punctuation in indexing and search operations. For example, the first set of punctuation can include hyphens, commas and/or semicolons. The second set of punctuation includes punctuation marks that are more likely to be useful when performing a search, such as the period or dot (.), commonly used in file extensions, and the "at" sign (@), which is commonly used in email addresses. Optionally, the user can specify which punctuation marks are to be included when indexing and performing searches, and which punctuation marks are to be ignored.

[0135] In one embodiment, when using a string of one or more characters as a search string on which to perform a search, such as an email or file content search, the search string is treated as a prefix. That is, the search string should match the initial characters and/or words in a potential matching string for the file or email to be displayed in the list pane or area. For example, if the search string is "act", the search application 102 will list a file containing the word "actual", but will not list a file if the only appearance of "act" is "fact."

[0136] The user can enter multiple separate search words or strings and each one will optionally be treated as a prefix. For example, searching "Joh Do" can be used to locate the strings "John Doe". Thus, one embodiment of the present invention provides multiword separate prefix searching. The searching can be performed incrementally. For example, if the user enter "Jo D" documents with the strings ("Jon" and "David"), ("Joe" and "Daniel"), ("John" and "Doe") will be located. If user then adds an "h" to "Jo" so that the search strings are now "Joh D" then the list of search results will be substantially immediately narrowed to present only documents having at least one string beginning with "Joh" and one string beginning with "D", such as a document containing ("John" and "Doe"). Further, the user can enter one or more additional search strings into one or more other search fields, such as one or more column search fields and the search system will incrementally

search for documents that have strings that correspondingly begin with the search strings or that are exact matches for the search strings.

[0137] Optionally, when certain standard characters are present in a given attribute, such as the standard "www." in a URL, the search application treats the character following the standard characters as the first character. Thus, for example, when searching for the string "loc" by entering it in the URL field 310E in Figure 3D, the URL "www.loc.gov.com" would be identified as a match. Optionally, the user can specify that the search application 102 should look for the search string no matter where it appears in a file or in email content.

[0138] In one embodiment, the main search field and/or attribute fields discussed above can act as a command line interface, in addition to acting as search fields. Thus, before executing or applying a search operation on one or more search strings, a determination is made as to whether the first search string corresponds to a command or is included in a list of command words. If the first word or string does correspond to a command word then a corresponding command file is read, and the corresponding command is executed. If there is more than one word or string entered into a search field, if the first word or string corresponds to a command word, then the subsequent words or strings are optionally treated as command arguments or terms, if appropriate. In addition, command files can call other command files by including the called command file name and relevant arguments. The list of command word can grow or shrink as the user adds or deletes commands. The present invention is not limited to receiving commands into a search filed. In other embodiments, other data entry fields can be used to enter commands as well as data.

[0139] By way of example, the command words can include email (corresponding to a command to create an email using the following term to determine who the addressee is), shop (corresponding to a command for finding the lowest online price for the product named in the following term), book (corresponding to a command for finding a book at a named Web site), movies (corresponding to a command for finding a listing of show times at a named Web site), web (corresponding to a command for launching a browser, and if there is a URL

following the “web” then the browser is launched to that URL), convert (corresponding to a command used to convert from one set of units or currency to another), msword (corresponding to a command to launch msword, and if there is a following term, open or create a document with a name corresponding to the term), programname (corresponding to a command to launch the program having the name programname), semail (corresponding to a command to search the email index using the following string(s)), sfiles (corresponding to a command to search the files index using the following string(s)), and so on with respect to the other search targets.

[0140] The command names can correspond to command files, which for example, can have the extension “.do,” though other extensions can be used as well. The command files can optionally be programmed, created and/or edited by an end user, thereby providing for significant customizing by users and without requiring sophisticated programming skills. Further, the user can add additional commands as desired. In addition, the command names can be names selected by the user that are easy for the user to remember, as opposed to arbitrary names, or difficult to remember names. The instructions included in the command files can be instructions unique to the search application, instructions corresponding to other applications, and/or instructions that correspond to operating system instructions. Thus, a search field can also be used as a DOS, UNIX, LINUX, or other operating system command line. The command file can also include a URL.

[0141] For example, if the user types "president bush" in the files search mode main search field, then the search application searches for a file that includes the terms “president” and “bush.” But if the user types "email samantha jones" the search application compares the first string, “email”, with the command list, recognizes that email is on the command list and that email is a command, retrieves an "email.do" command file that specifies how the command is to be processed, accordingly processes the term “samantha jones”, and generates a blank email to samantha jones by looking up the email address for samantha jones in the user’s email application.

[0142] By way of another example, if the user types in “semail samantha jones” the search application compares the first string, “semail”, with the command list, recognizes that semail is on the command list and that semail is a command, processes the rest of the line as an "semail" command, in this case a search within the user's indexed email for the strings “samantha” and “jones”.

[0143] Optionally, some of the commands can be built into the search application, and do not utilize a separate command file. For example, the semail, sfiles, and/or web commands can be built in and not use a separate command file.

[0144] Optionally, the results of the command are displayed using the list area and/or the view area. For example, with respect to the "semail" command, the list and view areas are employed as similarly described above with respect to Figure 3A.

[0145] At times, the arguments following a user-entered command may result in ambiguity in one of the arguments that are to be processed. For example, with respect to the convert command, where there is ambiguity, the user can be presented with several options from which the user can select. By way of example, if the user types "convert 5 miles" then the list area can be used to display user selectable choices, such as "meters", "feet", and “kilometers". If the user selects one of the choices, the search application will display the results in the view area. Thus, if the user selects “kilometers” the convert command with convert 5 miles into corresponding kilometers, and displays the results in the view area.

[0146] In another example, a command can be used to quickly retrieve information from a specific URL via the search application. For example, the book command file can include the following:

web http://search.barnesandnoble.com/booksearch/results.asp?WRD=$1

[0147] By way of further example, the movies command file can include the following:

web http://movies.yahoo.com/showtimes/showtimes.html?z=$1

[0148] The parameter “$1” in the above examples is filled in by the following string entered by the user. For example if the user typed in the entry

“movies lord” the movies command would launch a browser, access the yahoo movie show time site, submit the string “lord”, and the show times for movies that include the string “lord”, such as “Lord of the Rings” would be displayed to the user. If the string(s) following the command word are not HTML compliant, such as containing a space, HTML-escaping is performed, and the string(s) that are in violation will optionally be converted into an HTML compliant string, such a by replacing the space with a +sign. Thus, “lord rings” is optionally converted into “lord+rings.”

[0149] Advantageously, in certain embodiments, indexing of multiple forms of a word is performed, and where punctuation marks are in a word or character string, the word and character string can be selectively broken into multiple words or strings which can reduce index size and facilitate searching. For example, when indexing, a set of punctuation is optionally declared non-word symbols and are treated as spaces to separate words. For example, this set can include: < ([{ ". The foregoing example set members are selected because the included symbols are often used as open-parentheses and thus, a following character string can often be considered to be a new word. In addition, the double-quote is rarely used as a word joiner. Some characters, such as the < characters, are treated as a non-word symbol because they appear very frequently in HTML code used to used to generate Web pages. By excluding such characters, strings such as word are advantageously not treated as a word.

[0150] Optionally, punctuation not included in the set of excluded punctuation discussed above will be treated as the same as punctuation in the set only if the punctuation is within N characters of the start of the word. For example, N can be set at 2 or at another value. Optionally, punctuation not included in the set of excluded punctuation will be treated as a space if the punctuation is after P characters of the start of the word. For example, P can be set at 3, or 5, or at another value. By way of further example, if N=2 and M=3, xy.com would be indexed as one word because the period is not within 2 characters of the start of the string and is not more than 3 characters after the string. In another example, if N=2

and M=3, nbc.org is treated as two words, nbc and org because the period is more than 3 positions away from the start of the string.

[0151] The values of M and P are selected so that the portion of a word or character string before the punctuation is long enough, such that even if the string is treated as two separate words or strings each string will be sufficiently unique or identifiable for searching purposes. However, if the punctuation occurs too near the beginning of a word or string, treating the prefix as a separate word or string may not provide enough characters for a user to recognize the word or string. For example, if "a.m." were broken into two one word strings, "a" and "m", the search results would not be as useful or may not be useful at all.

[0152] Optionally, the index process indexes the individual words separated by punctuation, so that for xy.com, xy and com are separately indexed.

[0153] By way of further examples, if N = 2 and P = 5, then for johndoe@zxcv.ca, all the punctuation marks are treated as spaces and the following strings are separately indexed: johndoe, zxvc, ca. Similarly, the string me@mnbvcxza.net is treated as a word or a single string. For the string 1,234,467, 1,234 is treated as a word or single character string, and 467 is treated as a word or character string.

[0154] Further, a user can exclude files, emails, and the like that contain a specified string from appearing in search results displayed to the user. For example, in one embodiment, the user can exclude files or email containing a particular string by putting a minus sign at the beginning of the character string when entering it into the main search field or other relevant column field. If a user wants to search for a file that does not contain a first string as a prefix or exact match, and does contain a second string as a prefix or exact match, the user can put a minus sign in front of the string to be excluded, then follow that string by one or more spaces, and then the character string to be included. For example, if the user searches for an email that does not contain, as a prefix or exact match, the string “Fred” (or "Frederick", "Frederica", or other string or word with "Fred") and does include the string “Sol” (or “Solly”, Sole, or Solomon”), the user would enter “-Fred Sol”.

[0155] Thus, as described above, certain embodiments of the present invention provide advantageously provide for incremental searching for a variety of search targets. For example, the search targets can include one or more of files, emails, email attachments, Web pages, specific databases, and/or the like. Because a search is performed incrementally, the search results are provided or narrowed substantially immediately after each character is a search string is entered by a user. Thus, the user is provided with substantially immediate feedback as the search string is being entered, and so can quickly decide on the desirability of entering additional search characters, or of entering a new search string.

[0156] In addition, the user can specify that an exact word match is to be performed. In one example embodiment, if a selected punctuation symbol, such as =, follows a word or character string directly, and is followed by a space, as in "mark= ", then the word is searched as an exact match. In addition, optionally, if a selected punctuation symbol, which can be a !, @, #, $, %, ^, &, *,), ;, :, ‘, “, ?, >, and/or other punctuation symbol, follows a word or character string directly, and is followed by a space, as in "mark$ " or "mark. " or "mark- ", then optionally the word is searched as an exact match including the punctuation. So "mark- " will not match "market” or “mark. However, "mark-" will match "mark-down.”

[0157] In another embodiment, the search system described above is server-based, and the user can access the search functionally using a thin client. Thus, for example, the user does not need to download to or otherwise store the search application on the user’s terminal. Instead, the user can access over a network a remote search system and engine using a browser. The remote search system can be used to incrementally search content original to a Web site or database associated with the remote search system, and/or to search data that resides or originally resided on another Web site or network site. Nonetheless, even though the search engine is remotely located, once initial search results are transmitted to the thin client, the used can quickly scroll down and view the content corresponding to the items in the search results as if the search application was hosted by the thin client.

[0158] Figure 5 illustrates an example computer system that can be used to provide a server based incremental search system. As depicted, one embodiment includes a browser 504 stored on and executed by a user terminal 502. While in the illustrated embodiment the terminal 502 is a thin client, it can optionally include a local index engine, local search engine, and email application similar or identical to those discussed above with reference to terminal 104 illustrated in Figure 1. In the example embodiment, the browser 504 can interpret HTML tags, handle IFRAMES, and execute JavaScript. The terminal 502 is coupled to a remote site 508 via a network 506, which can be, by way of example, the Internet. The terminal 502 can be coupled to the Internet using a network interface circuit and port.

[0159] The remote site 508 includes a computer server 515 that executes and hosts a search engine 510, an index engine 513, and a Web server 514. The computer server 515 includes one or more content and index databases 512 and JavaScript, which will be discussed in greater detail below. The search and index engines 510, 513 can be the same as or similar to the search engine 107, index engine 103, search engine 110, and index engine 103 discussed above, and can provide the same or similar functionality. The Web site 108 and search engine 110 are accessible to the search application 102 via the Internet 113. The remote site 508 can be coupled to the Internet using a network interface circuit and port. The Web site 108 may optionally include content that spans multiple Internet domains, and/or may be implemented using physical servers that are geographically remote from one another. In other embodiments, the Web site 108 may be in the form of an intranet site, in which case the terminal 502 may be coupled to the site by a private network. For example, Web site 508 may be in the form of an internal corporate store site for company employees.

[0160] By way of example, the search engine 510 may search local server-based databases of the full text of Web pages selected from selected Web pages. The databases can optionally be generated using a spider or the like that search for Web pages on other Web sites, such as Web sites 518, 520, which are then stored in the databases, and that follow the links in those Web pages to other Web pages, which are then stored in the databases. Because the Web page

databases, or portions thereof, may have been generated before a user submits a search query, these databases may not be fully current. When the search engine 510 performs a Web search in response to a user query, the search engine returns excerpts from relevant Web pages as stored in a corresponding database, and also returns links to the current version of the Web pages, if such exists.

[0161] By way of further example, as similarly discussed above with reference to Figure 1, the server system can create indexes such as those illustrated in Figure 2A using the process illustrated in Figure 2C, can create prefix indexes, and can pre-compute sort lists.

[0162] Figure 6 illustrates an example search process using the server based search system. At state 602, the user accesses via the browser 504 the server based system 508 over the Internet 506. At state 504, the server system 508 transmits HTML, and/or other formatting code, text, and JavaScript to the browser 504. JavaScript is a client-side scripting language that runs inside an Internet browser or Web client. JavaScript can be embedded in Web pages or in other HTML documents. JavaScript can be used to enhance Web page dynamics and interactivity, and can be used to perform calculations, check forms, generate new HTML pages using variable information, open and close windows and frames, and the like. When the browser loads a page that includes JavaScript code, the browser's interpreter reads and executes the JavaScript code.

[0163] At state 606 the HTML code is rendered by the browser 504, the JavaScript is executed, and the browser 504 displays the search interface as similarly discussed above with reference to Figures 3A-I. Thus, for example, the search interface can include a list pane or area and a view pane or area, and well as the search area, including a main search field and column attribute fields. As similarly discussed above, the user can select a particular target search interface by clicking on an appropriate tab or link. For example, a given target search interface can include a plurality of search fields, including a main search field and a plurality of search fields. Thus, as similarly discussed above, an Internet search interface can include one or more of a content field, a URL field, a title or Web site name field, a

size field, a date field, a format field, a category field, a site field, a links field, and a language field, and a media type field.

[0164] At state 608, the browser, via the executed JavaScript, monitors user inputs or deletions from the interface fields. For example, the user can enter into the main search field and/or into one or more attribute search fields one or more alpha characters, numeric characters, words and/or phrases that the user thinks may appear in the target content or attributes. In addition, the browser monitors and detects whether the user is paging up or down, or is scrolling off the page. Optionally, the browser continuously monitors and detects user inputs, deletions, scrolling, and/or paging up or down (collectively and individually also referred to as "user changes") during states 610-622, and if such is detected, the process proceeds or returns to state 610. At state 610 the browser transmits the user changes to the server system 508.

[0165] At state 612 the server system 508 incrementally searches for Web pages, documents, or other files in accordance with the search character, characters, string, or strings received by the server system 508. Thus, with each additional character entered by the user and detected at state 608, the search engine 510 will further refine the search. Similarly, with each deletion of a search string character, the search engine 510 will reduce the amount of search filtering to broaden the search. For example, when the user types "fast", four separate searches are optionally sent to the server, one for "f", one for "fa", one for "fas", and one for "fast". Each time, the server finds all documents containing words starting with that sequence of letters, and returns a list of the top matches. At state 614 the server system 508 transmits a list of search results to the browser 504.

[0166] In one embodiment, the JavaScript optionally instructs the server system 508 how many results to return, so that only as many results as are needed to fill the list pane are transmitted. Advantageously, this reduces the load on the server system 508, increases the speed of presentation, and yet provides to the user the illusion that the list goes on further. In such an embodiment, when the user presses the PgDn button, clicks a More button, or scrolls down the list, an additional request is sent to the server for the next pagefull of results.

[0167] Optionally, to determine how long the transmitted search result list should be, the server system 508 autodetects the number of lines the browser 504 can display at a time. Optionally, the user can instruct the server system 508 on how long the list should be.

[0168] At state 616 the browser 504 displays the list in the list pane or area. At state 618, the browser 504 automatically selects the first item in the search result list to be displayed in the content pane or area. At state 620 to accelerate the presentation of content in the view pane for a selected item in the list pane, the pages or documents corresponding to the search result entries in the list pane are preloaded as soon as the list is received from the server system 508. The JavaScript loads IFRAMEs for each of the Web pages corresponding to the list entries. An inline floating frame or IFRAME is a construct which embeds a document into an HTML document so that embedded data can be displayed inside a subwindow of the browser's window. The IFRAME tag creates a floating frame at its location in the HTML file. The SRC attribute, which sets or retrieves a URL to be loaded, specifies the content to be displayed within the frame.

[0169] Thus, the Web page content loaded onto user's computer 502, while keeping hidden the display of the Web page content. Then, to present the content or Web page corresponding to a selected search list entry, the JavaScript renders the corresponding IFRAME visible in the view pane.

[0170] Figure 7 illustrates an example process of scrolling through a search list loaded via a browser as described above with reference to Figures 5 and 6. At state 702, the JavaScript detects when the user is scrolling up and down the list displayed in the browser 504. At state 704, the browser selects the corresponding search list item for display in the view pane. At state 706 the browser 504 displays the selected search result content that had already been stored in an IFRAME in the view pane. Advantageously, because the content for each item in the list has already been preloaded, the scrolling and content display takes place substantially instantaneously and the Internet does not have to be accessed.

[0171] Thus, as described above, certain embodiments of the present invention provide an efficient user interface, and advantageously provides for

incremental searching for a variety of search targets using client-based or server-based search applications. Because search can be performed incrementally, the user is provided with substantially immediate feedback as the search string is being entered, and so can quickly decide on the desirability of entering additional search characters. Advantageously, the user interface provides target specific attribute search fields, thereby enabling a user to efficiently locate the desired email, files, attachments, Web pages, and the like. In addition, in certain embodiments, incremental indexing is performed, thereby providing consistently current search indexes. Advantageously, in certain embodiments indexing of multiple forms of a word is performed, and where punctuation marks are in a word or character string, the word and character string can be selectively broken into multiple words or strings which can reduce index size and facilitate searching.

[0172] It should be understood that certain variations and modifications of this invention would suggest themselves to one of ordinary skill in the art. The scope of the present invention is not to be limited by the illustrations or the foregoing.

WHAT IS CLAIMED IS:

1. A computerized method of selectively executing a command, the method comprising:

providing a user interface comprising a first field;

receiving at least a first string from a user-controlled input device in the first field;

determining if the first string comprises a command;

selectively executing a command process in response to determining that the first string comprises a command; and

selectively initiating an incremental search of a plurality of documents in response to determining that the first string does not comprise a command, wherein the incremental search updates a list of documents selected from the plurality of documents that each comprise the first string, wherein the list is updated as each character of the first string is received from the user-controlled input device.

METHODS AND SYSTEMS FOR SEARCH INDEXING

Abstract of the Disclosure

The present invention provides for quick and efficient searching. One embodiment includes a first instruction configured to read at least a first search string and a second search string entered into a same first search field, and a second instruction configured to incrementally filter search results to locate at least a first document that has a least a first word that begins with the first string and a second word that begins with the second string.

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Electronic Acknowledgement Receipt

EFS ID:	29010377
Application Number:	15495507
International Application Number:	
Confirmation Number:	8371
Title of Invention:	METHODS AND SYSTEMS FOR SEARCH INDEXING
First Named Inventor/Applicant Name:	William Gross
Customer Number:	20995
Filer:	Russell M. Jeide/Angel Zehnder
Filer Authorized By:	Russell M. Jeide
Attorney Docket Number:	X1.002C4
Receipt Date:	24-APR-2017
Filing Date:	
Time Stamp:	17:22:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	ADS_X1-002C4.pdf	1823487 80dba4036a8d9be39817651748cf8d4296ec30b5	no	9

Warnings:

Information:					
2	Drawings-other than black and white line drawings	Drawings_X1-002C4.pdf	4570915 3a88fe40bcdc734b0d584a5534ede3d23791ee38	no	23
Warnings:					
Information:					
3		Spec_X1-002C4.pdf	182653 c3101355e240902058191037d18e3af4bbb81f4c	yes	49

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	47
	Claims	48	48
	Abstract	49	49

Warnings:	
Information:	
Total Files Size (in bytes):	6577055

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

SCORE Placeholder Sheet for IFW Content

Application Number: 15495507 Document Date: 04/24/2017

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

- Drawing

At the time of document entry (noted above):

- USPTO employees may access SCORE content via eDAN using the Supplemental Content tab, or via the SCORE web page.
- External customers may access SCORE content via PAIR using the Supplemental Content tab.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/495,507	04/24/2017	William Gross	X1.002C4

CONFIRMATION NO. 8371

FORMALITIES LETTER

OC000000090997130

20995
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

Date Mailed: 05/01/2017

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
  The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- $ **70** basic filing fee.
- $ **70** surcharge.
- $ **300** search fee.
- $ **360** examination fee.
- $(**0**) previous unapplied payment amount.
- $ **800** TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's

oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  William Gross
  Steven Lee Colwell

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice". https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/bnguyen/

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
15/495,507

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	1 minus 20 =	*	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	730		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
AMENDMENT A	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
AMENDMENT A	Application Size Fee (37 CFR 1.16(s))									
AMENDMENT A	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
AMENDMENT B	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
AMENDMENT B	Application Size Fee (37 CFR 1.16(s))									
AMENDMENT B	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/495,507	04/24/2017	2658	0.00	X1.002C4	1	1

CONFIRMATION NO. 8371

FILING RECEIPT

OC000000090997129

20995
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

Date Mailed: 05/01/2017

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

William Gross, Pasadena, CA;
Steven Lee Colwell, Santa Barbara, CA;

Applicant(s)

FUTURE SEARCH HOLDINGS, INC., Pasadena, CA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 14/507,519 10/06/2014 PAT 9633139
which is a CON of 11/972,563 01/10/2008 PAT 8856093
which is a CON of 10/654,588 09/03/2003 PAT 7370035
which claims benefit of 60/408,015 09/03/2002
and claims benefit of 60/413,013 09/23/2002
and claims benefit of 60/448,923 02/20/2003
and claims benefit of 60/470,903 05/14/2003
and claims benefit of 60/478,960 06/13/2003

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 04/28/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/495,507**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

METHODS AND SYSTEMS FOR SEARCH INDEXING

Preliminary Class

704

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

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technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

Please Direct All Correspondence to Customer Number 20995

RESPONSE TO FORMALITIES NOTICE

Inventor	:	William T. Gross
App. No.	:	15/495507
Filed	:	April 24, 2017
For	:	METHODS AND SYSTEMS FOR SEARCH INDEXING
Art Unit	:	2658
Conf No.	:	8371

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

The above-captioned application was filed lacking at least one item that would advance the application to examination. Enclosed in compliance with 37 CFR 1.53(f) are the following:

(X) Declarations for: William Gross and Steven Lee Colwell

(X) Power of Attorney by Applicant.

(X) Information Disclosure Statement; PTO/SB/08 in 4 pages.

(X) Rescission of Any Prior Disclaimers and Request to Revisit Art.

The present application qualifies for small entity status under 37 CFR § 1.27.

(X) Fees will be paid via EFS Web. Any extension of time will be requested by payment of the appropriate extension fee.

The Commissioner is hereby authorized to charge any additional fees which may be required, now or in the future, or credit any overpayment, to Account No. 11-1410.

/Russell M. Jeide/
Russell Jeide
Registration No. 54,198
Registered Practitioner
Customer No. 20995
(949) 760-0404

26610910

PTO/AIA/01 (06-12)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	METHODS AND SYSTEMS FOR SEARCH INDEXING

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 14/507,519

filed on October 6, 2014.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: William Gross Date (Optional): 11-6-15

Signature: William Gross

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/AIA/01 (06-12)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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☐ The attached application, or

☒ United States application or PCT international application number 14/507,519 filed on October 6, 2014.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

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LEGAL NAME OF INVENTOR

Inventor: Steven Lee Colwell Date (Optional): 11-10-15

Signature: [illegible]

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Please Direct All Correspondence to Customer Number 20995

RESCISSION OF ANY PRIOR DISCLAIMERS AND REQUEST TO REVISIT ART

Inventor	:	William T. Gross
App. No	:	15/495507
Filed	:	April 24, 2017
For	:	METHODS AND SYSTEMS FOR SEARCH INDEXING
Examiner	:	Unassigned
Art Unit	:	2658
Conf #	:	8371

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

The claims of the present application are different and possibly broader in scope than the claims pursued in the parent application(s). To the extent any prior amendments or characterizations of the scope of any claim or referenced art could be construed as a disclaimer of any subject matter supported by the present disclosure, Applicant hereby rescinds and retracts such disclaimer. Accordingly, the references previously considered in the parent application(s) may need to be re-visited.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Knobbe, Martens, Olson & Bear, LLP

Respectfully submitted,

Dated: September 1, 2017

/Russell M. Jeide/

Russell Jeide
Registration No. 54,198
Registered Practitioner
Customer No. 20995
(949) 760-0404

26612086

PTO/AIA/82A (07-13)
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TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	15/495507
Filing Date	April 24, 2017
First Named Inventor	William Gross
Title	METHODS AND SYSTEMS FOR SEARCH INDEXING
Art Unit	2658
Examiner Name	Unassigned
Attorney Docket Number	X1.002C4

SIGNATURE of Applicant or Patent Practitioner

Signature	/Russell M. Jeide/	Date (Optional)	2017-09-01
Name	Russell M. Jeide	Registration Number	54,198
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/AIA/82B (07-13)
Approved for use through 11/30/2014. OMB 0651-0051
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 20995

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☐ The address associated with the above-mentioned Customer Number

OR

☑ The address associated with Customer Number: 20995

OR

Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Future Search Holdings, Inc.

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	11/6/15
Name	MARCIA GOODSTEIN		
Title	PRESIDENT		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

INFORMATION DISCLOSURE STATEMENT

First Inventor	:	William T. Gross
App. No.	:	15/495507
Filed	:	April 24, 2017
For	:	METHODS AND SYSTEMS FOR SEARCH INDEXING
Examiner	:	Unassigned
Art Unit	:	2658
Conf. No.	:	8371

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith. Listed references are of record in U.S. patent application No. 14/507519, now Patent No. 9633139, filed October 6, 2014, which is the parent of this Continuation application, and is relied upon for an earlier filing date under 35 USC 120. Copies of the references are not submitted pursuant to 37 CFR 1.98(d).

Pursuant to 37 C.F.R § 1.97(g) and (h), Applicant makes no representation that the information is considered to be material to patentability. Additionally, inclusion on this list is not an admission that any of the cited documents are prior art in this application. Further, Applicant makes no representation regarding the completeness of this list, or that better art does not exist.

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed before the receipt of a First Office Action on the merits, and presumably no fee is required. If a First Office Action on the merits was mailed before the mailing date of this Statement, the Commissioner is authorized to charge the fee set forth in 37 CFR 1.17(p) to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: September 1, 2017

By: /Russell M. Jeide/

Russell Jeide
Registration No. 54,198
Registered Practitioner
Customer No. 20995
(949) 760-0404

26347695

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/495507
	Filing Date	April 24, 2017
	First Named Inventor	William Gross
	Art Unit	2658
(Multiple sheets used when necessary)	Examiner	Unassigned
SHEET 1 OF 4	Attorney Docket No.	X1.002C4

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	5,111,398 A	05-05-1992	Nunberg et al	
	2	5,303,361 A	04-1994	Colwell et al.	
	3	5,671,426 A	09-23-1997	Armstrong, III, John	
	4	5,692,173 A	11-25-1997	Chew, Chee Heng	
	5	5,721,897 A	02-24-1998	Rubinstein, Seymour I	
	6	5,778,361 a	07-1998	Nanjo et al.	
	7	5,819,273 A	10-06-1998	Vora et al.	
	8	5,832,208 A	11-03-1998	Chen et al.	
	9	5,907,837 A	05-25-1999	Ferrel et al.	
	10	5,920,854 A	07-06-1999	Kirsch et al.	
	11	6,006,225 A	12-21-1999	Bowman	
	12	6,035,325 A	03-07-2000	Potts	
	13	6,070,158 A	05-30-2000	Kirsch et al.	
	14	6,073,133 A	06-06-2000	Chrabaszcz	
	15	6,085,193 A	07-04-2000	Malkin et al.	
	16	6,112,172 A	08-29-2000	True et al.	
	17	6,182,068 B1	01-2001	Culliss	
	18	6,216,122 B1	04-10-2001	Elson	
	19	6,330,567 B1	12-11-2001	Chao	
	20	6,366,923 B1	04-2002	Lenk et al.	
	21	6,421,675 B1	07-16-2002	Ryan et al.	
	22	6,564,213 B1	05-13-2003	Ortega et al.	
	23	6,606,304 B1	08-2003	Grinter et al.	
	24	6,615,237 B1	09-02-2003	Kyne et al.	
	25	6,665,668 B1	12-16-2003	Sugaya et al.	
	26	6,711,565 B1	03-23-2004	Subramaniam et al.	
	27	6,704,747 B1	03-2004	Fong, Joseph Shi -Piu	
	28	6,751,603 B1	06-15-2004	Bauer et al.	
	29	6,757,713 B1	06-2004	Ogilvie et al.	

Examiner Signature	Date Considered

***Examiner:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T[1] - Place a check mark in this area when an English language Translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/495507
	Filing Date	April 24, 2017
	First Named Inventor	William Gross
	Art Unit	2658
(Multiple sheets used when necessary)	Examiner	Unassigned
SHEET 2 OF 4	Attorney Docket No.	X1.002C4

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	30	6,847,959 B1	01-25-2005	Arrouye et al.	
	31	6,862,713 B1	03-01-2005	Kraft et al.	
	32	6,873,982 B1	03-29-2005	Bates et al.	
	33	6,961,731 B2	11-01-2005	David M. Holbrook	
	34	7,035,903 B1	04-25-2006	Baldonado	
	35	7,047,502 B2	05-2006	Petropoulos et al.	
	36	7,054,855 B3	05-2006	Basso et al.	
	37	7,370,035 B2	05-2008	Gross et al.	
	38	7,424,510 B2	09-2008	Gross et al.	
	39	7,496,559 B2	02-2009	Gross et al.	
	40	8,019,741 B2	09-13-2011	Gross et al.	
	41	9,633,139	04-25-2017	Gross et al.	
	42	2001/0027406 A1	10-2001	Araki et al.	
	43	2001/0039490	11-08-2001	Verbitsky et al.	
	44	2001/0029508 A1	10-2001	Okada et al.	
	45	2002/0007384	01-2002	Ushioda, Akira	
	46	2002/0055981	05-09-2002	Spaey et al.	
	47	2002/0092019 A1	07-2002	Marcus, Dwight	
	48	2002/0019679 A1	02-2002	Okada et al.	
	49	2002/0111962	08/2002	Crucs, Kevin M.	
	50	2002/0165707	11-07-2002	Call, Charles L.	
	51	2002/0169763	11-14-2002	Tada et al.	
	52	2002/0178009	11-28-2002	Firman, Thomas R	
	53	2002/0184317	12-05-2002	Thankachan, Matthew	
	54	2003/0014415	01-16-2003	Weiss et al.	
	55	2003/0037321 A1	02-2003	Bowen, Matt	
	56	2002/0087408 A1	07-04-2002	Burnett	
	57	2003/0130993	07-10-2003	Mendelevitch et al.	
	58	2003/0171910 A1	09-2003	Abir, Eli	

Examiner Signature	Date Considered

***Examiner:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T[1] - Place a check mark in this area when an English language Translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/495507
	Filing Date	April 24, 2017
	First Named Inventor	William Gross
	Art Unit	2658
(Multiple sheets used when necessary)	Examiner	Unassigned
SHEET 3 OF 4	Attorney Docket No.	X1.002C4

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	59	2003/0227489	12-11-2003	Arend et al.	
	60	2003/0229898	12-11-2003	Babu et al.	
	61	2003/0233419	12-18-2003	Beringer, Joerg	
	62	2004/0073443	04-2004	Gabrick et al.	
	63	2004/0133564	07-08-2004	Gross et al.	
	64	2004/0143564	07-22-2004	Gross et al.	
	65	2004/0143569	07-22-2004	Gross et al.	
	66	2005/0256846	11-17-2005	Zigmond et al.	
	67	2006/0168067 A1	07-27-2006	Carlson et al.	
	68	2008-0114761 A1	05-2008	Gross et al.	
	69	2009-0150363 A1	06-2009	Gross et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials	Cite No.	Foreign Patent Document *Country Code-Number-Kind Code* Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T[1]
	70	WO 99/01802	01-14-1999	Maine et al.		
	71	WO 99/39286	08-05-1999	Ainsbury et al.		
	72	WO 00/67159	11-09-2000	Adar et al.		
	73	WO 2004/023243	03-2004	Gross et al.		

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[1]
	74	Lotus Magellan Product Information Guide, Circa 1989	
	75	Lotus Magellan Explorer's Guide" ©1989 Lotus Development Corporation	
	76	Chris Sherman, "Enfish Tracker Pro," © January 1999; printed from http://www.onlinemag.net/OL1999/sherman1.html	
	77	Jon Halpin, "PC Data Finder Goes A-Hunting," 19 June 2001; printed from http://www.pcmag.com/article2/0,4149,144228,00.asp	

Examiner Signature	Date Considered

***Examiner:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T[1] - Place a check mark in this area when an English language Translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/495507
	Filing Date	April 24, 2017
	First Named Inventor	William Gross
	Art Unit	2658
(Multiple sheets used when necessary)	Examiner	Unassigned
SHEET 4 OF 4	Attorney Docket No.	X1.002C4

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[1]
	78	Carol Ellison, "Info to Go," 30 June 2002; printed from http://www.pcmag.com/article2/0,1759,3575.00.asp	
	79	Steve Barth, 'Personal Toolkit: Navigating Information and Ideas," KMWorld April 2003, Volume 12, Issue 4; printed from http://www.kmworld.com/publications/magazine/Index.cfm?action=readarticle&article id-1505&publication id=1	
	80	Copy of International Search Report from corresponding PCT Application PCT/US03/27241	
	81	Chapter 14, Section 14.5 "JavaScript & DHTML Cookbook" by Danny Goodman; ISBN:0-596-00467-2; Publisher: O'Reilly; Print Publication Date 4/1/03	
	82	Stop words, Wikipedia, http://en.wikipedia.org/wiki/Stop_words; December 12, 2006	
	83	Inverted index, Wikipedia, http://en.wikipedia.org/wiki/Inverted_index; December 12, 2006	
	84	Proximity search (text), Wikipedia, http://en.wikipedia.org/wiki/Proximity_search_%28text%29; December 12, 2006	
	85	Computing Service, Email Addresses in Microsoft Outlook 98, December 05, 2000, Pages 1-3	
	86	http://www2.essex.ac.uk/cs/services/email/addressing2.html - searched on www.waybackmachine.com – Internet Archive Wayback Machine	
	87	Pogue, David, *Finding Files and Web Sites with Sherlock 2,* MAC OS 9: THE MISSING MANUAL, Chapter 15, pages 257-278, March 30, 2000	
	88	Shneiderman, B., et al., *Clarifying Search: A User-Interface Framework for Test Searches*, D-Lib Magazine, January 1997	
	89	Supplementary Search Report for EP 03794539.1, filed September 3, 2003 (Attorney Docket No.: X1.001VEP)	
	90	International Search Report for PCT/US2003/027241, filed September 3, 2003 (Attorney Docket No. X1.001VPC)	

26347604
072017

Examiner Signature	Date Considered
***Examiner:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T[1] - Place a check mark in this area when an English language Translation is attached.

Electronic Patent Application Fee Transmittal

Application Number:	15495507
Filing Date:	24-Apr-2017
Title of Invention:	METHODS AND SYSTEMS FOR SEARCH INDEXING
First Named Inventor/Applicant Name:	William Gross
Filer:	Russell M. Jeide/Lynn Marmolijo
Attorney Docket Number:	X1.002C4

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	70	70
UTILITY SEARCH FEE	2111	1	300	300
UTILITY EXAMINATION FEE	2311	1	360	360
Pages:				
Claims:				
Miscellaneous-Filing:				
LATE FILING FEE FOR OATH OR DECLARATION	2051	1	70	70
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 2 months with $0 paid	2252	1	300	300
Miscellaneous:				
		Total in USD ($)		**1100**

Electronic Acknowledgement Receipt

EFS ID:	30250135
Application Number:	15495507
International Application Number:	
Confirmation Number:	8371
Title of Invention:	METHODS AND SYSTEMS FOR SEARCH INDEXING
First Named Inventor/Applicant Name:	William Gross
Customer Number:	20995
Filer:	Russell M. Jeide/Chelsea Burdeno
Filer Authorized By:	Russell M. Jeide
Attorney Docket Number:	X1.002C4
Receipt Date:	01-SEP-2017
Filing Date:	24-APR-2017
Time Stamp:	13:05:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1100
RAM confirmation Number	090517INTEFSW13060100
Deposit Account	111410
Authorized User	Chelsea Burdeno

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	response-mp.pdf	69214 673b286fa86baefa10dfe3c4b835c187ae8669e0	no	1
Warnings:					
Information:					
2	Oath or Declaration filed	oaths.pdf	487724 7a42ec4ba30e1313791d7316feccbc7ddbdf8767	no	2
Warnings:					
Information:					
3	Miscellaneous Incoming Letter	revisit-art.pdf	63903 e977aa22ab24236e402a0ea93e8ea60d379753c9	no	1
Warnings:					
Information:					
4	Transmittal Letter	poa-trans.pdf	1038854 a95859e2c1f4b3b00b18cbfb59fd9ec45c07f005	no	1
Warnings:					
Information:					
5	Power of Attorney	poa.pdf	1052886 d67cb23a1c6fea24fd27467ec2e095d99c00837d	no	1
Warnings:					
Information:					
6	Transmittal Letter	ids-transmittal.pdf	72021 1c89907bd3b364d5cc82371f3156531d5df86992	no	2
Warnings:					
Information:					

7	Information Disclosure Statement (IDS) Form (SB08)	ids-list.pdf	109052 0b92d21c4a296fd93e1128fda5e9fae70e400c0d	no	4
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
8	Fee Worksheet (SB06)	fee-info.pdf	38703 c37f10f85a05c36fcd1a1257b508669d3fd4a9e8	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	2932357	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/495,507	04/24/2017	2658	800	X1.002C4	1	1

CONFIRMATION NO. 8371

UPDATED FILING RECEIPT

OC000000093856489

20995
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

Date Mailed: 09/06/2017

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

William Gross, Pasadena, CA;
Steven Lee Colwell, Santa Barbara, CA;

Applicant(s)

FUTURE SEARCH HOLDINGS, INC., Pasadena, CA;

Power of Attorney: The patent practitioners associated with Customer Number 20995

Domestic Priority data as claimed by applicant

This application is a CON of 14/507,519 10/06/2014 PAT 9633139
which is a CON of 11/972,563 01/10/2008 PAT 8856093
which is a CON of 10/654,588 09/03/2003 PAT 7370035
which claims benefit of 60/408,015 09/03/2002
and claims benefit of 60/413,013 09/23/2002
and claims benefit of 60/448,923 02/20/2003
and claims benefit of 60/470,903 05/14/2003
and claims benefit of 60/478,960 06/13/2003

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 04/28/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/495,507**

Projected Publication Date: 12/14/2017

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

METHODS AND SYSTEMS FOR SEARCH INDEXING

Preliminary Class

704

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
15/495,507

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	1 minus 20 =	*	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	730		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
AMENDMENT A	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
AMENDMENT A	Application Size Fee (37 CFR 1.16(s))									
AMENDMENT A	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
AMENDMENT B	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
AMENDMENT B	Application Size Fee (37 CFR 1.16(s))									
AMENDMENT B	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/495,507	04/24/2017	William Gross	X1.002C4

CONFIRMATION NO. 8371

POA ACCEPTANCE LETTER

20995
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

OC000000093856490

Date Mailed: 09/06/2017

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/01/2017.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/agizaw/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor	:	William T. Gross
App. No.	:	15/495507
Filed	:	April 24, 2017
For	:	METHODS AND SYSTEMS FOR SEARCH INDEXING
Examiner	:	Unassigned
Art Unit	:	2658
Conf. No.	:	8371

PRELIMINARY AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Please enter the following amendments:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 5 of this paper.

AMENDMENTS TO THE CLAIMS

1. (Canceled)

2. (New) A computing system comprising:

one or more hardware computer processors;

a display device viewable by a user of the computing system;

a computer readable storage medium storing:

an index data structure comprising associations between each of a plurality of character strings to associated files of a plurality of files in which the character strings are included; and

software instructions executable by the one or more hardware computer processors causing the computing system to:

cause display of an interactive user interface on the display device, the interactive user interface including at least a first search field;

receive a first partial search string in the first search field;

receive a second partial search string in the first search field;

wherein the first and second partial search strings are separated by a string separator character in the first search field;

searching the index data structure for a first one or more of the plurality of files each including at least one string that corresponds to the first partial search string;

searching the index data structure for a second one or more of the plurality of files each including at least one string that corresponds to the second partial search string; and

updating a set of matching files of the plurality of files as each successive character of the first partial search string and the second partial search string is received respectively in the first search field by identifying any of the plurality of files included in both the first one or more of the plurality of files and the second one or more of the plurality of files, wherein the first partial search string and the second partial search string are non-adjacent in at least one of the matching files.

3. (New) The computing system of claim 2, wherein the set of matching files includes a first file wherein the first partial search string precedes the second partial search string.

4. (New) The computing system of claim 3, wherein the set of matching files includes a second file wherein the second partial search string precedes the first partial search string.

5. (New) The computing system of claim 2, wherein the index data structure comprises indications of character strings associated with respective attribute fields of the files.

6. (New) The computing system of claim 2, wherein the interactive user interface includes at least:

an email search mode interface having email-specific attribute search fields including at least a date field, a from field, and a sender field;

a document search mode interface having document-specific attribute search fields including one or more of a file name field, a file type field, a date field, a file size field, and a path field; and

an email attachment search mode interface including one or more of a name field, a date field, a size field, and an extension field

7. (New) The computing system of claim 2, wherein the index data structure is generated and updated by an index module that generates at least an email index corresponding to a first plurality of the files that are emails, a document index corresponding to a second plurality of the files that are documents, and an email attachment index corresponding to a third plurality of files that are email attachment files; and

8. (New) The computing system of claim 2, wherein the index data structure includes an email index, a document index, and an email attachment index.

9. (New) The computing system of claim 2, wherein the first partial search string comprises characters corresponding to at least a portion of a first string being searched for and the second partial search string comprises characters corresponding to at least a portion of a second string being searched for.

10. (New) The computing system of claim 2, wherein the software instructions further cause the computing system to:

display in the interactive user interface indications of the set of matching files.

11. (New) The computing system of claim 10, wherein the software instructions further cause the computing system to:

receive selection of a first file of the displayed set of matching files; and

display in the interactive user interface a portion of the first file.

12. (New) The computing system of claim 11, wherein the software instructions further cause the computing system to:

highlight a plurality of occurrences of the first and second partial search strings in the first file while not highlighting portions of text between occurrences of the first and second partial search strings in the first file.

13. (New) The computing system of claim 2, wherein the string separator character is selected from: a space, “<”, “(”, “[”, “{”, “ “ ”, “!”, “@”, “#”, “$”, “%”, “^”, “&”, “*”, “)”, “;”, “:”, “”, “?”, “>”, “,”, “=”, and “+”.

14. (New) The computing system of claim 2, wherein the files comprise emails, text documents, contact information, appointment information, task information, music files, system files, photographs, videos, and/or images.

15. (New) The computing system of claim 2, wherein the first search field corresponds to a single field of the files and matching files are identified based only on content of the single field of the files.

16. (New) The computing system of claim 15, wherein the single field comprises one of: to, from, cc, bcc, subject, folder name, date, size, attachments, or body fields of email files.

17. (New) The computing system of claim 15, wherein the single field comprises one of: name, path, size, item type, date modified, date created, or content fields of document files.

18. (New) The computing system of claim 15, wherein the single field comprises one of: name, email address, phone number, company, job title, or content fields of contacts files.

19. (New) The computing system of claim 15, wherein the single field comprises one of: subject, start date/time, duration, recipients, location, recurrence, attendees, attachments, or content fields of calendar files.

20. (New) The computing system of claim 2, wherein the first partial search string applies to all textual content of the files and the second partial search string applies to only a single field of the files.

21. (New) The computing system of claim 2, wherein modifiers can be applied to either or both of the first partial search string and second partial search string to include one or more operators selected from: AND, OR, NOT, NEAR, date ranges, and size ranges.

REMARKS

Prior to examination on the merits, Applicant submits the above claim amendments. In particular, claim 1 is canceled and new claims 2 – 21 are added. No new matter is added by these amendments. Consideration of claims 2 – 21 is respectfully requested.

No Disclaimers or Disavowals

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: September 7, 2017

By: /Russell M. Jeide/

Russell Jeide
Registration No. 54,198
Registered Practitioner
Customer No. 20995
(949) 760-0404

26615202

Electronic Acknowledgement Receipt

EFS ID:	30298676
Application Number:	15495507
International Application Number:	
Confirmation Number:	8371
Title of Invention:	METHODS AND SYSTEMS FOR SEARCH INDEXING
First Named Inventor/Applicant Name:	William Gross
Customer Number:	20995
Filer:	Russell M. Jeide/Tony Do
Filer Authorized By:	Russell M. Jeide
Attorney Docket Number:	X1.002C4
Receipt Date:	07-SEP-2017
Filing Date:	24-APR-2017
Time Stamp:	16:46:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		x1002c4.pdf	93564 807ea4d6bbab15ea21436b8c49040493d8d60cb2	yes	5

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Preliminary Amendment	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	5
Warnings:			
Information:			
	Total Files Size (in bytes):	93564	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	
15/495,507	04/24/2017	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	x $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	x $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT

09/07/2017	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	x $40 =	0
Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	x $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
AMANDA FORD

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/495,507	04/24/2017	William Gross	X1.002C4

CONFIRMATION NO. 8371

PUBLICATION NOTICE

OC000000096092951

20995
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

Title:METHODS AND SYSTEMS FOR SEARCH INDEXING

Publication No.US-2017-0357734-A1
Publication Date:12/14/2017

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently https://portal.uspto.gov/pair/PublicPair. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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Alexandria, Virginia 22313-1450
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NOTICE OF ALLOWANCE AND FEE(S) DUE

20995 7590 09/30/2019
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER
JOHNSON, JOHNESE T

ART UNIT	PAPER NUMBER
2168	

DATE MAILED: 09/30/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/495,507	04/24/2017	William Gross	X1.002C4	8371

TITLE OF INVENTION: METHODS AND SYSTEMS FOR SEARCH INDEXING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	12/30/2019

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

20995 7590 09/30/2019
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/495,507	04/24/2017	William Gross	X1.002C4	8371

TITLE OF INVENTION: METHODS AND SYSTEMS FOR SEARCH INDEXING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	12/30/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
JOHNSON, JOHNESE T	2168	707-769000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1_____
2_____
3_____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/495,507	04/24/2017	William Gross	X1.002C4	8371

20995 7590 09/30/2019
KNOBBE MARTENS OLSON & BEAR LLP
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FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER
JOHNSON, JOHNESE T

ART UNIT	PAPER NUMBER
2168	

DATE MAILED: 09/30/2019

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 15/495,507	Applicant(s) Gross et al.	
	Examiner JOHNESE T JOHNSON	Art Unit 2168	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to CLAIMS FILED 9/7/2017.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 2-21 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 9/1/17.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/J.T.J/ Examiner, Art Unit 2168	/IRETE F EHICHIOYA/ Supervisory Patent Examiner, Art Unit 2168

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

2. This communication is in response to the claims filed on 9/7/2017.

Allowable Subject Matter

3. After thorough search and examination of the present application and in light of the prior art made of record, claims 2-21 are allowed.

Reason for Allowance

4. The prior art made of record does not teach or fairly suggest the combination of elements, as recited in independent claim 2.

More specifically, the prior art of records does not specifically suggest the limitation of "updating a set of matching files of the plurality of files as each successive character of the first partial search string and the second partial search string is received respectively in the first search field by identifying any of the plurality of files included in both the first one or more of the plurality of files and the second one or more of the plurality of files, wherein the first partial search string and the second partial search string are non-adjacent in at least one of the matching files" in combination with all the other limitations in the independent claim 2.

These features together with other limitations of the independent claim are novel and non-obvious over the prior art of record. The dependent claims 3-21 being definite, enabled by the specification, and further limiting to the independent claims, are also allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHNESE T JOHNSON whose telephone number is (571)270-1097. The examiner can normally be reached on Monday-Friday (10-630).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fred Ehichioya can be reached on 571-272-403434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. J./
Examiner, Art Unit 2166
September 3, 2019
JJ

/IRETE F EHICHIOYA/
Supervisory Patent Examiner, Art Unit 2168

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/495,507	Gross et al.
	Examiner	**Art Unit**
	JOHNESE T JOHNSON	2168

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	09/03/2019								
	2	=								
	3	=								
	4	=								
	5	=								
	6	=								
	7	=								
	8	=								
	9	=								
	10	=								
	11	=								
	12	=								
	13	=								
	14	=								
	15	=								
	16	=								
	17	=								
	18	=								
	19	=								
	20	=								
	21	=								

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/495,507	Gross et al.
	Examiner	**Art Unit**
	JOHNESE T JOHNSON	2168

CPC						
Symbol					**Type**	**Version**
G06F	/	16	/	90344	F	2019-01-01
G06F	/	16	/	95	I	2019-01-01
G06F	/	16	/	903	I	2019-01-01
G06F	/	16	/	951	I	2019-01-01
H04L	/	51	/	22	I	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

/JOHNESE T JOHNSON/ Examiner, Art Unit 2168 (Assistant Examiner)	03 September 2019 (Date)	**Total Claims Allowed:** 20	
/IRETE F EHICHIOYA/ Supervisory Patent Examiner, Art Unit 2168 (Primary Examiner)	23 September 2019 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office

Part of Paper No.: 20190815

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/495,507	Gross et al.
	Examiner	**Art Unit**
	JOHNESE T JOHNSON	2168

INTERNATIONAL CLASSIFICATION				
CLAIMED				
G06F	/	16	/	30

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
707	769

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

/JOHNESE T JOHNSON/ Examiner, Art Unit 2168 (Assistant Examiner)	03 September 2019 (Date)	**Total Claims Allowed:** 20	
/IRETE F EHICHIOYA/ Supervisory Patent Examiner, Art Unit 2168 (Primary Examiner)	23 September 2019 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office

Part of Paper No.: 20190815

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/495,507	Gross et al.
	Examiner	**Art Unit**
	JOHNESE T JOHNSON	2168

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	2	10	11	19	20										
2	3	11	12	20	21										
3	4	12	13												
4	5	13	14												
5	6	14	15												
6	7	15	16												
7	8	16	17												
8	9	17	18												
9	10	18	19												

/JOHNESE T JOHNSON/ Examiner, Art Unit 2168 (Assistant Examiner)	03 September 2019 (Date)	**Total Claims Allowed:** 20	
/IRETE F EHICHIOYA/ Supervisory Patent Examiner, Art Unit 2168 (Primary Examiner)	23 September 2019 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office

Part of Paper No.: 20190815

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/495,507	Gross et al.
	Examiner	**Art Unit**
	JOHNESE T JOHNSON	2168

CPC - Searched*		
Symbol	**Date**	**Examiner**
G06F16/90344 - with limiting keywords	09/03/2019	JJ
G06F16/30 - with limiting keywords	09/03/2019	JJ

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
707	769 - with limiting keywords	09/03/2019	JJ
707	with limiting keywords	09/03/2019	JJ

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
searched east DB	09/03/2019	JJ
searched applicant and inventor in east DB	09/03/2019	JJ
searched assignee in PALM	09/03/2019	JJ
searched for double patenting in PALM	09/03/2019	JJ
reviewed parent in continuation for DP	09/03/2019	JJ
reviewed applications/ patents in continuity map for DP	09/03/2019	JJ
searched US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB in east DB	09/03/2019	JJ
searched google and google patents for "incremental character search + multiple search fileds + non-adjacent results within documents"	09/03/2019	JJ
searched iq.ip.com for "incremental character search + multiple search fileds + non-adjacent results within documents"	09/03/2019	JJ

/J.T.J/ Examiner, Art Unit 2168	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/495,507	Gross et al.
	Examiner	**Art Unit**
	JOHNESE T JOHNSON	2168

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
G06F	16/90344 - with limiting keywords	09/03/2019	JJ
707	769 - with limiting keywords	09/03/2019	JJ
G06F	16/30- with limiting keywords	09/03/2019	JJ
707	with limiting keywords	09/03/2019	JJ

/J.T.J/ Examiner, Art Unit 2168	

Bibliographic Data

Application No: 15/495,507

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /JOHNESE T JOHNSON/ (Examiner's Signature) JJ (Initials)

Title: METHODS AND SYSTEMS FOR SEARCH INDEXING

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
04/24/2017	707	2168	X1.002C4
RULE			

APPLICANTS

FUTURE SEARCH HOLDINGS, INC., Pasadena, CA, UNITED STATES

INVENTORS

William Gross Pasadena, CA, UNITED STATES

Steven Lee Colwell Santa Barbara, CA, UNITED STATES

CONTINUING DATA

This application is a CON of 14507519 10/06/2014 PAT 9633139

14507519 is a CON of 11972563 01/10/2008 PAT 8856093

11972563 is a CON of 10654588 09/03/2003 PAT 7370035

10654588 has PRO of 60478960 06/13/2003

10654588 has PRO of 60470903 05/14/2003

10654588 has PRO of 60448923 02/20/2003

10654588 has PRO of 60413013 09/23/2002

10654588 has PRO of 60408015 09/03/2002

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

04/28/2017

**** SMALL ENTITY ****

STATE OR COUNTRY

UNITED STATES

ADDRESS

KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR

IRVINE, CA 92614
UNITED STATES

FILING FEE RECEIVED

$1,100

Google

incremental character search + multiple search fileds + non-adjacent results with

Sign in

All News Videos Images Shopping More Settings Tools

About 18,500,000 results (0.96 seconds)

Bash - incremental history search (ctrl+r) - matching multiple non ...
https://unix.stackexchange.com › questions › bash-incremental-history-sear...
2 answers
Jun 15, 2015 - Readline provides commands for searching through the command history for ... to do the grep and edit your history file so that the results appear at the end. ... I'm assuming you want to find the 2 (or more) words no matter which order they appear in. .... Bug in Lualatex: not printing characters from calculation
Missing: fields + | Must include: fields +

People also ask

How do I use Vlookup to find multiple values?

Can I use Vlookup to return multiple values?

How does Index match multiple results?

How do you use multiple match in Excel?

Feedback

Find & Replace - ActiveState
docs.activestate.com › komodo › manual › search
Fast Find (Incremental Search). Use the Fast Find bar to quickly find a word or string in the file you are currently editing. Fast Find Toolbar. Start an incremental ...

Advanced Searching - LexisNexis® Support
lexisnexis.custhelp.com › app › answers › answer_view › a_id › advanced...
In Concordance, Boolean operators search at the document level. ... individual character fields in words creating a broader search with stronger results. ... If a word is not in the dictionary, use relational searching ... Example. Dictionary words are added with the OR operator to the Advanced Search field if you add multiple ...
Missing: incremental | Must include: incremental

Use INDEX to lookup multiple values in a list. Learn Microsoft Ex...
https://fiveminutelessons.com › learn-microsoft-excel › use-index-lookup-...
Excel INDEX function to find multiple instances of a value, sample data table .... There's not much to see when we use this version of the formula, but here is what our ... The selected cells will change to show you the correct results, and the ..... Thus, all fields in the OHL Log Date columns that are blank are the Dates when ...

CA2867182A1 - System and method for finding desired results b...
www.google.com › patents
INCREMENTAL SEARCH USING AN AMBIGUOUS KEYPAD WITH THE ... Field of invention [0002] The present invention relates generally to performing ... during an incremental search as the user types in the single or multiple prefixes ... variants include variants based on nonadjacent characters of the descriptive terms, ...

Live, As-You-Type Search in FileMaker -- FileMaker Inspirations
filemakerinspirations.com › 2009/10 › live-as-you-type-search-in-filemaker
Oct 14, 2009 - Place a global search field with a script trigger in the header of your list ... In the Google-Like Searches in Filemaker -- Non Contiguous article except that ... begin typing in the field and their search results will be refined as they type ..... It also splits up multiple word queries so that if you type "Doc Mart", it will ...

Searching - Adobe

https://docs.adobe.com › help › using › settings › c-about-searching-menu

Mar 18, 2019 - **Multiple** word queries return more refined **results** than single-word queries. For example, our .... **Searches** for **documents** that contain all of the words in the **query** string. Use of "+" and ... **No field** specifier with the colon **character** (:). ... the **results**. See Configuring an **incremental** index of a staged website .

Return Multiple Match Values in Excel - Xelplus - Leila Gharani

https://www.xelplus.com › return-multiple-match-values-in-excel

Quickly learn how to return **multiple** match **results** in Excel. ... a value **in** a large data table and returning a result from the **adjacent** columns. .... Our objective is **not** to find the smallest word, we want to know which cells in ... We want the SMALL function to **increment** by one for each copy of the .... Excel Download Practice **file** ...

SQLite FTS5 Extension

https://www.sqlite.org › fts5

FTS5 is an SQLite virtual table module that provides full-text **search** functionality to ... an FTS5 table has an implicit INTEGER PRIMARY KEY **field** named rowid. ... **Characters** that are **not** currently allowed **in** barewords, are **not** quote ... As you might expect, a prefix token matches any **document** token of which it is a prefix.

dtSearch - Relativity documentation

https://help.relativity.com › Content › Relativity › dtSearch › dtSearch

After building your dtSearch index, the Dictionary **search** option is also available. ... Note. **Within a field**, dtSearch truncates any string longer than 32 **characters** that doesn't ... Separate **multiple** entries with a semicolon. ... but changes to the index are **not** reflected **in search results** until the **incremental** build is complete.

Missing: ~~adjacent~~ | Must include: adjacent

Searches related to incremental character search + multiple search fields + non-adjacent results within document

how to search **for** multiple **words in excel**

excel search multiple **criteria**

excel index match multiple results **horizontally**

find all matching cells excel

multi vlookup excel sheet

multiple **match excel**

how to vlookup for same name multiple **instances**

vlookup same value different results

1 2 3 4 5 6 7 8 9 10 Next

Rocky Mount, North Carolina - Based on your past activity - Use precise location - Learn more

Help Send feedback Privacy Terms

Discover | Pats & Apps | incremental character sear... | + 0 mods | 0 filters | STIC

Visuals | Query | Results | 0 Selected | Relevance | None | None

1 - 50 17,496,334 results

1. **Methods and systems for search indexing**

The present invention provides for quick and efficient searching. One embodiment includes a first instruction configured to read at least a first search string and a second search string entered into a same first search field, and a second instruction configured to incrementally filter search...

CURRENT ASSIGNEES: FUTURE SEARCH HLDG INC
US9633139 | US PATENTS | 25-APR-2017

2. **Methods and systems for search indexing**

The present invention provides for quick and efficient searching. One embodiment includes a first instruction configured to read at least a first search string and a second search string entered into a same first search field, and a second instruction configured to incrementally filter search...

CURRENT ASSIGNEES: GROSS WILLIAM [+1]
US20150095363 | US APPLICATIONS | 02-APR-2015

3. **Methods and systems for search indexing**

The present invention provides for quick and efficient searching. One embodiment includes a first instruction configured to read at least a first search string and a second search string entered into a same first search field, and a second instruction configured to incrementally filter search...

CURRENT ASSIGNEES: FUTURE SEARCH HLDG INC
US8498977 | US PATENTS | 30-JUL-2013

4. **Methods and systems for search indexing**

The present invention provides for quick and efficient searching. One embodiment includes a first instruction configured to read at least a first search string and a second search string entered into a same first search field, and a second instruction configured to incrementally filter search...

CURRENT ASSIGNEES: FUTURE SEARCH HLDG INC
US20170357734 | US APPLICATIONS | 14-DEC-2017

5. **Systems and methods for managing endian mode of a device**

Systems, methods, and devices for managing endian-ness are disclosed. In one embodiment, a device is configured to selectively operate in one of a big-endian operating mode or a little-endian operating mode. The device may include a register in which the current endian mode of the device is...

CURRENT ASSIGNEES: MICRON TECH INC
TWI419458 | TAIWAN PATENTS | 11-DEC-2013

6. **Method and system for unified searching and incremental searching across and within multiple documents**

A user-interface system and method for searching among multiple documents and searching for subsections within individual documents using a single search interface on an input-constrained user device having a screen and a keypad.

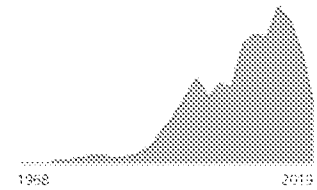
CURRENT ASSIGNEES: VEVEO INC

Top 1500 results

Relevance VIEW

0 Results
4 Results
0 Results
0 Results
0 Results

Publication Date VIEW



Cur Assignee by Relevance VIEW

FUTURE SEARCH HLDG INC (14)
GROSS WILLIAM (1)
MICRON TECH INC (73)
VEVEO INC (64)
X1 TECH INC (2)
HITACHI SOFTWARE ENG C... (2)
NORTHROP GRUMMAN SY... (2)

More Visuals

Result #1 PREV NEXT

Patents

incremental character search + multiple search fields + non-adjacent resul

Sign in

About 212 results

Download Side-by-side

Sort by · Relevance · Group by · None · Deduplicate by · Family · Results / page · 10

Method and apparatus for span and subspan sorting rendering system

WO EP US JP AU DE · JPH11515121A · ダウク，ジェローム，エフ，，ジェニア・レイカー，インコーポレイテッド
Priority 1995-07-26 · Filed 1996-07-26 · Published 1999-12-21
... sequence: 1) is input to SMCCAM800 the (above) the geometric **characteristics** of the span for query operations to write, 2) the query **results** written ...) introduces a conservative approximation of an ideal occlusion region by performing range **searches**, provides a MCCAM, wherein stored in the **field** ...

Method and system for **searching** information

WO EP US CN JP AT AU BR CA DE IL MX SG ZA · CN1367901B · 伊罗·拉普斯顿 · 西尔弗布鲁克研究股份有限公司
Priority 1999-06-30 · Filed 2000-06-30 · Granted 2010-05-26 · Published 2010-05-26
... following in about: **search** text; preferred ordering of **search results**; a preferred language; related to a date range; and a author of the **document**. ... A hyperlink set may be used to hyperlink behavior with a **field** such as a selection frame correlation. It can also be "**incremental** submit" with a

Method and computer program product for geophysical and geologic data ...

WO US · US8402058B2 · John Conner · Ensoco, Inc.
Priority 2009-01-13 · Filed 2010-01-13 · Granted 2013-03-19 · Published 2013-03-19
... keyword string. Do not add a **character**, like a skip. Add one to the "error" counter. Add 1 to the "next" index. Do not **increment** the "match" counter. ... FIG. 16 is an example of a phrase **search**; FIG. 17 shows the **results** of a **search** by **file** type(s); FIGS. 18-20 show geodetically classified data ...

Automated processing of appropriateness determination of content for **search** ...

WO BR US CN JP KR AU · CN1582216A · 多米尼科·张 · 奥弗图尔服务公司
Priority 2002-09-13 · Filed 2003-09-09 · Published 2005-10-12
As a **result**, **many** users are **searching** for information **find** themselves unexpectedly pleaded suffered heavily accessed pornographic and gambling ... maximum bid **field** 314 represents a fixed amount bid. If the bid is automatically incremented, the highest bid **field** 314 represents an auto-**increment** ...

Systems and methods for summarization and visualization of trace data

WO US CA · US10303585B2 · Daniel D. O'Dowd · Green Hills Software Llc
Priority 2016-10-11 · Filed 2018-09-19 · Granted 2019-05-28 · Published 2019-05-28
they are able to limit the **search results** to just those contained within that time range (4820). In certain embodiments, each **file** signal is stored in the "**Search**" text **field**. 2. Advanced **searches** where **multiple** text **searches** can be used to **find** ranges in time where specific states are true, as ...

Processing techniques for visual capture data from a rendered **document**

US · US8874504B2 · Martin T. King · Google Inc.
Priority 2004-12-03 · Filed 2010-03-22 · Granted 2014-10-28 · Published 2014-10-28
... represents a number of **character** positions separating recurring instance of each letter within the text of the selected **document** portion, **searches** ... 10. P-Commerce **Many** of the actions made possible by the system **result** in some commercial transaction taking place. The phrase p-commerce is used ...

Processing techniques for visual capture data from a rendered **document**

WO EP US KR · US20070011140A1 · Martin King · King Martin T
Priority 2004-02-15 · Filed 2005-04-19 · Published 2007-01-11
Extra **fields** can be added to such an index that will help in the case of a paper-based **search**. Index Entry Indicating **Document** Availability in Paper ... a font about which it has no specific knowledge can be grown **incrementally** and extended, based on its "general" knowledge of "relative" **character** ...

Processing techniques for visual capture data from a rendered **document**

WO BR JP KR · EP1759278A2 · Martin T. King · Exbiblio B.V.
Priority 2004-04-19 · Filed 2005-04-19 · Published 2007-03-07
... a font about which it has no specific knowledge can be grown **incrementally** and extended, based on its "general" knowledge of "relative " **character** ... [00350] There are at least two separate revenue streams that can **result** from **searches** originating from paper **documents**: one revenue stream from the ...

Network element management system

WO BR US CN JP AU · WO2000075788A1 · Gilbert Levesque · Fujitsu Network Communications, Inc.
Priority 1999-05-26 · Filed 2000-05-25 · Published 2000-12-14
If there are **multiple** Meta Objects of the same type (e.g. two STS 1 facilities) which have same **characteristics**, they are mapped to the same Meta ... operator inputs which command changes have been stored in a log **file**: but this **results** in a large text **file** which is extremely difficult to **search**.

Element management system with dynamic database updates based on parsed ...

About Send Feedback Public Datasets Terms Privacy Policy

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/495507
	Filing Date	April 24, 2017
	First Named Inventor	William Gross
	Art Unit	2658
(Multiple sheets used when necessary)	Examiner	Unassigned
SHEET 1 OF 4	Attorney Docket No.	X1.002C4

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	5,111,398 A	05-05-1992	Nunberg et al	
	2	5,303,361 A	04-1994	Colwell et al.	
	3	5,671,426 A	09-23-1997	Armstrong, III, John	
	4	5,692,173 A	11-25-1997	Chew, Chee Heng	
	5	5,721,897 A	02-24-1998	Rubinstein, Seymour I	
	6	5,778,361 a	07-1998	Nanjo et al.	
	7	5,819,273 A	10-06-1998	Vora et al.	
	8	5,832,208 A	11-03-1998	Chen et al.	
	9	5,907,837 A	05-25-1999	Ferrel et al.	
	10	5,920,854 A	07-06-1999	Kirsch et al.	
	11	6,006,225 A	12-21-1999	Bowman	
	12	6,035,325 A	03-07-2000	Potts	
	13	6,070,158 A	05-30-2000	Kirsch et al.	
	14	6,073,133 A	06-06-2000	Chrabaszcz	
	15	6,085,193 A	07-04-2000	Malkin et al.	
	16	6,112,172 A	08-29-2000	True et al.	
	17	6,182,068 B1	01-2001	Culliss	
	18	6,216,122 B1	04-10-2001	Elson	
	19	6,330,567 B1	12-11-2001	Chao	
	20	6,366,923 B1	04-2002	Lenk et al.	
	21	6,421,675 B1	07-16-2002	Ryan et al.	
	22	6,564,213 B1	05-13-2003	Ortega et al.	
	23	6,606,304 B1	08-2003	Grinter et al.	
	24	6,615,237 B1	09-02-2003	Kyne et al.	
	25	6,665,668 B1	12-16-2003	Sugaya et al.	
	26	6,711,565 B1	03-23-2004	Subramaniam et al.	
	27	6,704,747 B1	03-2004	Fong, Joseph Shi -Piu	
	28	6,751,603 B1	06-15-2004	Bauer et al.	
	29	6,757,713 B1	06-2004	Ogilvie et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.T.J/

Examiner Signature /JOHNESE T JOHNSON/	Date Considered 09/03/2019

***Examiner:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T[1] - Place a check mark in this area when an English language Translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/495507
	Filing Date	April 24, 2017
	First Named Inventor	William Gross
	Art Unit	2658
(Multiple sheets used when necessary)	Examiner	Unassigned
SHEET 2 OF 4	Attorney Docket No.	X1.002C4

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	30	6,847,959 B1	01-25-2005	Arrouye et al.	
	31	6,862,713 B1	03-01-2005	Kraft et al.	
	32	6,873,982 B1	03-29-2005	Bates et al.	
	33	6,961,731 B2	11-01-2005	David M. Holbrook	
	34	7,035,903 B1	04-25-2006	Baldonado	
	35	7,047,502 B2	05-2006	Petropoulos et al.	
	36	7,054,855 B3	05-2006	Basso et al.	
	37	7,370,035 B2	05-2008	Gross et al.	
	38	7,424,510 B2	09-2008	Gross et al.	
	39	7,496,559 B2	02-2009	Gross et al.	
	40	8,019,741 B2	09-13-2011	Gross et al.	
	41	9,633,139	04-25-2017	Gross et al.	
	42	2001/0027406 A1	10-2001	Araki et al.	
	43	2001/0039490	11-08-2001	Verbitsky et al.	
	44	2001/0029508 A1	10-2001	Okada et al.	
	45	2002/0007384	01-2002	Ushioda, Akira	
	46	2002/0055981	05-09-2002	Spaey et al.	
	47	2002/0092019 A1	07-2002	Marcus, Dwight	
	48	2002/0019679 A1	02-2002	Okada et al.	
	49	2002/0111962	08/2002	Crucs, Kevin M.	
	50	2002/0165707	11-07-2002	Call, Charles L.	
	51	2002/0169763	11-14-2002	Tada et al.	
	52	2002/0178009	11-28-2002	Firman, Thomas R	
	53	2002/0184317	12-05-2002	Thankachan, Matthew	
	54	2003/0014415	01-16-2003	Weiss et al.	
	55	2003/0037321 A1	02-2003	Bowen, Matt	
	56	2002/0087408 A1	07-04-2002	Burnett	
	57	2003/0130993	07-10-2003	Mendelevitch et al.	
	58	2003/0171910 A1	09-2003	Abir, Eli	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.T.J/

Examiner Signature /JOHNESE T JOHNSON/	Date Considered 09/03/2019

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	Art Unit	2658
(Multiple sheets used when necessary)	Examiner	Unassigned
SHEET 3 OF 4	Attorney Docket No.	X1.002C4

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	59	2003/0227489	12-11-2003	Arend et al.	
	60	2003/0229898	12-11-2003	Babu et al.	
	61	2003/0233419	12-18-2003	Beringer, Joerg	
	62	2004/0073443	04-2004	Gabrick et al.	
	63	2004/0133564	07-08-2004	Gross et al.	
	64	2004/0143564	07-22-2004	Gross et al.	
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	66	2005/0256846	11-17-2005	Zigmond et al.	
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	69	2009-0150363 A1	06-2009	Gross et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials	Cite No.	Foreign Patent Document *Country Code-Number-Kind Code* Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T[1]
	70	WO 99/01802	01-14-1999	Maine et al.		
	71	WO 99/39286	08-05-1999	Ainsbury et al.		
	72	WO 00/67159	11-09-2000	Adar et al.		
	73	WO 2004/023243	03-2004	Gross et al.		

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[1]
	74	Lotus Magellan Product Information Guide, Circa 1989	
	75	Lotus Magellan Explorer's Guide" ©1989 Lotus Development Corporation	
	76	Chris Sherman, "Enfish Tracker Pro," © January 1999; printed from http://www.onlinemag.net/OL1999/sherman1.html	
	77	Jon Halpin, "PC Data Finder Goes A-Hunting," 19 June 2001; printed from http://www.pcmag.com/article2/0,4149,144228,00.asp	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.T.J/

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***Examiner:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/495507
	Filing Date	April 24, 2017
	First Named Inventor	William Gross
	Art Unit	2658
(Multiple sheets used when necessary)	Examiner	Unassigned
SHEET 4 OF 4	Attorney Docket No.	X1.002C4

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[1]
	78	Carol Ellison, "Info to Go," 30 June 2002; printed from http://www.pcmag.com/article2/0,1759,3575.00.asp	
	79	Steve Barth, 'Personal Toolkit: Navigating Information and Ideas," KMWorld April 2003, Volume 12, Issue 4; printed from http://www.kmworld.com/publications/magazine/Index.cfm?action=readarticle&article id-1505&publication id=1	
	80	Copy of International Search Report from corresponding PCT Application PCT/US03/27241	
	81	Chapter 14, Section 14.5 "JavaScript & DHTML Cookbook" by Danny Goodman; ISBN:0-596-00467-2; Publisher: O'Reilly; Print Publication Date 4/1/03	
	82	Stop words, Wikipedia, http://en.wikipedia.org/wiki/Stop_words; December 12, 2006	
	83	Inverted index, Wikipedia, http://en.wikipedia.org/wiki/Inverted_index; December 12, 2006	
	84	Proximity search (text), Wikipedia, http://en.wikipedia.org/wiki/Proximity_search_%28text%29; December 12, 2006	
	85	Computing Service, Email Addresses in Microsoft Outlook 98, December 05, 2000, Pages 1-3	
	86	http://www2.essex.ac.uk/cs/services/email/addressing2.html - searched on www.waybackmachine.com – Internet Archive Wayback Machine	
	87	Pogue, David, *Finding Files and Web Sites with Sherlock 2,* MAC OS 9: THE MISSING MANUAL, Chapter 15, pages 257-278, March 30, 2000	
	88	Shneiderman, B., et al., *Clarifying Search: A User-Interface Framework for Test Searches*, D-Lib Magazine, January 1997	
	89	Supplementary Search Report for EP 03794539.1, filed September 3, 2003 (Attorney Docket No.: X1.001VEP)	
	90	International Search Report for PCT/US2003/027241, filed September 3, 2003 (Attorney Docket No. X1.001VPC)	

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Examiner Signature	/JOHNESE T JOHNSON/	Date Considered	09/03/2019

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	((("FUTURE") near3 ("SEARCH") near3 ("HOLDINGS") near3 ("INC"))).AS,AANM.	USPAT	AND	ON	2019/08/15 13:46
S2	348	((("GROSS") near3 ("William")) OR (("COLWELL") near3 ("Steven"))).INV.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	AND	ON	2019/08/15 13:46
S3	16239	(G06F16/90344.cpc. or 707/769.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/08/15 13:56
S4	10	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/08/20 14:55
S5	2	("20170357734").PN.	US-PGPUB; USPAT; USOCR; DERWENT	AND	ON	2019/08/28 15:54
S6	1	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings) and (partial near4 search near4 strings)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 09:21
S7	2	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings) and (partial near4 search)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 09:22
S8	2	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings) and (partial near4 string)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 09:23
S9	1	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings)	US-PGPUB; USPAT; USOCR;	AND	ON	2019/09/03 09:26

		and (search adj2 fields) and (string near4 separator)	FPRS; EPO; JPO; DERWENT; IBM_TDB			
S10	0	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings) and ((plurality or multiple or many) naer4 fields) and (separat$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 09:33
S11	1	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings) and ((plurality or multiple or many) near4 fields) and (separat$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 09:33
S12	1	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings) and ((plurality or multiple or many) with search with fields) and (separat$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 09:34
S13	2	(G06F16/30.cpc. or "707".clas.) and (index$4 with associations with strings) and (character near4 strings) and ((plurality or multiple or many) with search with fields) and (separat$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 09:35
S14	0	(G06F16/30.cpc. or "707".clas.) and (index$4 with associations with strings) and (character near4 strings) and ((plurality or multiple or many) with search with fields) and (separat$4) and (each adj2 field)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 09:36
S15	0	(index$4 with associations with strings) and (character near4 strings) and ((plurality or multiple or many) with search with fields) and (separat$4) and (each adj2 field)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 09:36
S16	0	(index$4 with associations with strings) and (character near4 strings) and (separat$4) and (each adj2 field)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 09:36
L1	7	(index$4 with associations with strings) and (character near4 strings) and ("search fields")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 10:41
L2	2	(index$4 with associations with strings)	US-PGPUB;	AND	ON	2019/09/03

		and (character near4 strings) and ("search fields") and (updat$4 with results with character)	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			10:45
L3	0	(index$4 with associations with strings) and (character near4 strings) and ("search fields") and (updat$4 with results with character) and incremental$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 10:48
L4	1	(index$4 with associations with strings) and (character near4 strings) and ("search fields") and incremental$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 10:48
L5	84	(index$4 with strings) and (character near4 strings) and ("search fields") and incremental$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 10:49
L6	4	(index$4 with strings) and (character near4 strings) and ("search fields") and incremental$4 and (string with non$adjacent)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 11:00
L7	3	(index$4 with strings) and (character near4 strings) and ("search fields") and incremental$4 and ((hit or results or words or keywords) with non$adjacent)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 11:01
L8	4	(index$4 with strings) and (character near4 strings) and ("search fields") and incremental$4 and ((hit or results or words or keywords) with different with (lines or paragraphs))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 11:01
L9	4	(index$4 with strings) and (character near4 strings) and ("search fields") and incremental$4 and ((string or hit or results or words or keywords) with different with (lines or paragraphs))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 11:02
L10	0	(index$4 with strings) and (character near4 strings) and ("search fields") and incremental$4 and ((string or hit or results or words or keywords) with different with (lines or paragraphs)) and ((first adj2 string) with preceed$4 with	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	AND	ON	2019/09/03 11:58

		(second adj2 string))	IBM_TDB			
L11	2	(search with index) and (incremental with search$4 with ((multiple or several or plurality or many or each) with (search adj2 "fields")))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/09/03 12:01

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L12	2	((("FUTURE") near3 ("SEARCH") near3 ("HOLDINGS") near3 ("INC"))).AS,AANM.	US-PGPUB; USPAT	AND	ON	2019/09/03 12:12
L13	255	((("GROSS") near3 ("William")) OR (("COLWELL") near3 ("Steven"))).INV.	US-PGPUB; USPAT	AND	ON	2019/09/03 12:12
L14	9122	(G06F16/90344.cpc. or 707/769.ccls.)	US-PGPUB; USPAT	AND	ON	2019/09/03 12:12
L15	10	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings)	US-PGPUB; USPAT	AND	ON	2019/09/03 12:12
L16	1	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings) and (partial near4 search near4 strings)	US-PGPUB; USPAT	AND	ON	2019/09/03 12:13
L17	2	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings) and (partial near4 search)	US-PGPUB; USPAT	AND	ON	2019/09/03 12:13
L18	2	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings) and (partial near4 string)	US-PGPUB; USPAT	AND	ON	2019/09/03 12:13
L19	1	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings) and (search adj2 fields) and (string near4 separator)	US-PGPUB; USPAT	AND	ON	2019/09/03 12:13
L20	0	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings) and ((plurality or multiple or many) naer4 fields) and (separat$4)	US-PGPUB; USPAT	AND	ON	2019/09/03 12:13
L21	1	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings) and ((plurality or multiple or many) near4 fields) and (separat$4)	US-PGPUB; USPAT	AND	ON	2019/09/03 12:13
L22	1	(G06F16/90344.cpc. or 707/769.ccls.) and (index$4 with associations with strings) and (character near4 strings) and ((plurality or multiple or many) with search with fields) and (separat$4)	US-PGPUB; USPAT	AND	ON	2019/09/03 12:13
L23	2	(G06F16/30.cpc. or "707".clas.) and (index$4 with associations with strings) and (character near4 strings) and ((plurality or multiple or	US-PGPUB; USPAT	AND	ON	2019/09/03 12:13

		many) with search with fields) and (separat$4)				
L24	0	(G06F16/30.cpc. or "707".clas.) and (index$4 with associations with strings) and (character near4 strings) and ((plurality or multiple or many) with search with fields) and (separat$4) and (each adj2 field)	US-PGPUB; USPAT	AND	ON	2019/09/03 12:13
L25	0	(index$4 with associations with strings) and (character near4 strings) and ((plurality or multiple or many) with search with fields) and (separat$4) and (each adj2 field)	US-PGPUB; USPAT	AND	ON	2019/09/03 12:13
L26	0	(index$4 with associations with strings) and (character near4 strings) and (separat$4) and (each adj2 field)	US-PGPUB; USPAT	AND	ON	2019/09/03 12:13
L27	0	(index$4 with associations with strings) and (character near4 strings) and ((plurality or multiple or many) with search with fields) and (separat$4) and (each adj2 field)	US-PGPUB; USPAT	AND	ON	2019/09/03 12:13

9/ 3/ 2019 12:17:56 PM
C:\ Users\ jjohnson14\ Documents\ EAST\ Workspaces\ 15495507.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	William Gross
App. No	:	15/495507
Filed	:	April 24, 2017
For	:	METHODS AND SYSTEMS FOR SEARCH INDEXING
Examiner	:	Johnese T. Johnson
Art Unit	:	2168
Conf No.	:	8371

COMMENTS ON THE EXAMINER'S STATEMENT OF REASONS FOR ALLOWANCE

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant takes no position regarding any reasons for allowance presented by the Examiner (in the Notice of Allowance or elsewhere in the application's file history) other than the positions Applicant may have previously taken during prosecution. Therefore, the Examiner's reasons for allowance should not be attributed to Applicant as an indication of the basis for Applicant's belief that the claims are patentable. Furthermore, Applicant respectfully asserts that there may also be additional reasons for patentability of the claimed subject matter not explicitly stated in this record and Applicant does not waive its rights to such arguments by not further addressing such reasons herein.

Applicant also respectfully reserves the right to traverse the characterizations of what any particular reference shows or teaches, of what any combination of references shows or teaches, or the appropriateness of combining references. Further, by making certain amendments to the claims, Applicant is not conceding that previously pending claims are not patentable. Rather, the amendments are being made to facilitate

expeditious prosecution of this application. Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the application's disclosure. Accordingly, reviewers of this or any child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: December 12, 2019

By: /Russell M. Jeide/
Russell M. Jeide
Registration No. 54,198
Attorney of Record
Customer No. 20,995
(949) 760-0404

31606531

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/495,507	04/24/2017	William Gross	X1.002C4	8371

TITLE OF INVENTION: METHODS AND SYSTEMS FOR SEARCH INDEXING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	12/30/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
JOHNSON, JOHNESE T	2168	707-769000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Knobbe, Martens, Olson & Bear LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Future Search Holdings, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Pasadena, CA

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies

4b. Method of Payment: *(Please first compply any previously paid fee shown above)*

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 11-1410

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Russell M. Jeide/ Date December 12, 2019

Typed or printed name Russell M. Jeide Registration No. 54198

Electronic Patent Application Fee Transmittal

Application Number:	15495507
Filing Date:	24-Apr-2017
Title of Invention:	METHODS AND SYSTEMS FOR SEARCH INDEXING
First Named Inventor/Applicant Name:	William Gross
Filer:	Russell M. Jeide/Lynn Marmolijo
Attorney Docket Number:	X1.002C4

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	500	500

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**500**

Electronic Acknowledgement Receipt

EFS ID:	38009104
Application Number:	15495507
International Application Number:	
Confirmation Number:	8371
Title of Invention:	METHODS AND SYSTEMS FOR SEARCH INDEXING
First Named Inventor/Applicant Name:	William Gross
Customer Number:	20995
Filer:	Russell M. Jeide/Gustavo Lopez
Filer Authorized By:	Russell M. Jeide
Attorney Docket Number:	X1.002C4
Receipt Date:	12-DEC-2019
Filing Date:	24-APR-2017
Time Stamp:	17:21:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$500
RAM confirmation Number	E2019BBH22249285
Deposit Account	111410
Authorized User	Gustavo Lopez

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Post Allowance Communication - Incoming	comments.pdf	86763 e05cf4ad39a671ff02add237f02196e772ea04eb	no	2
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	issue_fee_trans.pdf	527350 9a6072520008a08b177b594ee09861fc56dddda0d	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30070 297267f53dc944a3ac7fc9903edd1e658b7b3b19	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	644183	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/495,507	04/24/2017	William Gross	X1.002C4	8371

20995 7590 12/26/2019
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER
JOHNSON, JOHNESE T

ART UNIT	PAPER NUMBER
2168	

NOTIFICATION DATE	DELIVERY MODE
12/26/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

efiling@knobbe.com
jayna.cartee@knobbe.com

PTOL-90A (Rev. 04/07)

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR/ PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
15/495,507	04/24/2017	Gross et al.	X1.002C4

	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614	JOHNESE T JOHNSON	
	ART UNIT	PAPER
	2168	20191218

DATE MAILED: 18 December 2019

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

Please see the attached examiner's amendment to claims 6 and 7.

/J.T.J/ Examiner, Art Unit 2168	/BORIS GORNEY/ Supervisory Patent Examiner, Art Unit 2158

PTO-90C (Rev.04-03)

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in an interview with Russell Jeide (Reg. No. 54,198) on December 18, 2019.

3. The application has been amended as follows:

6. The computing system of claim 2, wherein the interactive user interface includes at least:

an email search mode interface having email-specific attribute search fields including at least a date field, a from field, and a sender field;

a document search mode interface having document-specific attribute search fields including one or more of a file name field, a file type field, a date field, a file size field, and a path field; and

an email attachment search mode interface including one or more of a name field, a date field, a size field, and an extension field.

7. The computing system of claim 2, wherein the index data structure is generated and updated by an index module that generates at least an

email index corresponding to a first plurality of the files that are emails, a document index corresponding to a second plurality of the files that are documents, and an email attachment index corresponding to a third plurality of files that are email attachment files~~; and~~.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHNESE T JOHNSON whose telephone number is (571)270-1097. The examiner can normally be reached on Monday-Friday (10-630).

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fred Ehichioya can be reached on 571-272-4034. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see https://ppair-my.uspto.gov/pair/PrivatePair. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J.T.J/
Examiner, Art Unit 2168
December 19, 2019
JJ

/BORIS GORNEY/
Supervisory Patent Examiner, Art Unit 2158

Examiner-Initiated Interview Summary	Application No. 15/495,507	Applicant(s) Gross et al.	
	Examiner JOHNESE T JOHNSON	Art Unit 2168	AIA (FITF) Status No

All participants (applicant, applicant's representative, PTO personnel):

(1) JOHNESE T. JOHNSON. (3) _____.

(2) Russell Jeide (Reg. No. 54,198). (4) _____.

Date of Interview: 18 December 2019.

Type: ☑ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☑ No.
If Yes, brief description: _____.

Issues Discussed ☐ 101 ☐ 112 ☐ 102 ☐ 103 ☑ Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 6-7.

Identification of prior art discussed: N/A.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Mr. Jeide gave the examiner permission to add a period at the end of claim 6 and to remove the semicolon and the word "and" at the end of claim 7 and add a period..

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/J.T.J/ Examiner, Art Unit 2168	/BORIS GORNEY/ Supervisory Patent Examiner, Art Unit 2158

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/495,507	02/04/2020	10552490	X1.002C4	8371

20995 7590 01/15/2020

KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 432 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

FUTURE SEARCH HOLDINGS, INC., Pasadena, CA;
William Gross, Pasadena, CA;
Steven Lee Colwell, Santa Barbara, CA;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.