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(71) Applicant *(for all designated States except US)*: **GOOGLE INC.** [US/US]; 1600 Amphitheatre Parkway, Building 41, Mountain View, CA 94043 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **HOGUE, Andrew** [US/US]; 45 Elmwood Avenue, Ho Ho Kus, NJ 07423 (US). **REYNAR, Jeff** [US/US]; 526 E. 11th Street, New York, NY 10009 (US). **GORDON, Michael** [US/US]; 825 President Street, Brooklyn, NY 11215 (US). **VESPE, David** [US/US]; 309 W. 86th Street, #10B, New York, NY 10024 (US). **PETROU, David** [US/US]; 350 Degraw, Apt. #2, Brooklyn, NY 11231 (US).

(74) Agents: **HOFFMAN, Brian, M.** et al.; FENWICK & WEST LLP, SILICON VALLEY CENTER, 801 California Street, Mountain View, CA 94041 (US).

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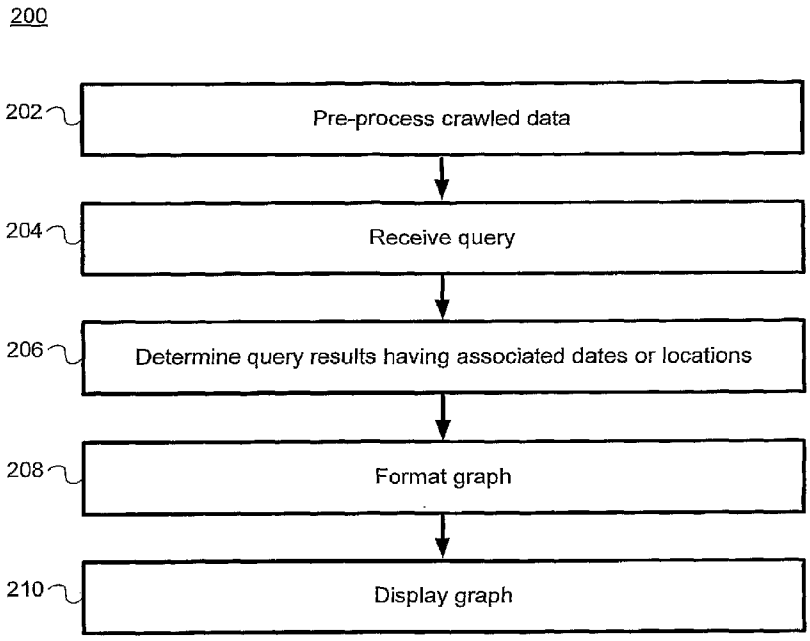

(57) Abstract: Embodiments retrieve a set of search results that have been previously identified as having at least one associated date or location. A timeline or map is displayed that visually represents the distribution of the dates or locations within the results. The timeline is displayed with a histogram graph corresponding to the number of dates in the search results at points along the timeline. The map is displayed with markers at the locations corresponding to the locations in the search results. The user can navigate the result set using the displayed timeline or map.

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DISPLAYING SEARCH RESULTS ON A ONE OR TWO DIMENSIONAL GRAPH

Inventors: Andrew Hogue
Jeff Reynar
Michael Gordon
David Vespe
David Petrou

CROSS-REFERENCE TO RELATED APPLICATION(S)

[0001] This application is related to U.S. Application No.11/535,843, entitled "Displaying Facts on a Linear Graph," filed September 27, 2006, and U.S. Application No. 11/342,277, entitled "Data Object Visualization Using Graphs," filed January 27, 2006, which are hereby incorporated by reference in their entirety.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] This invention pertains in general to data visualization on a computer and, in particular, to ways of representing data obtained from web pages and other sources.

2. Description of the Related Art

[0003] The development of information retrieval systems has predominantly focused on improving the overall usefulness of the search results presented to the user. Information retrieval systems, or 'search engines' in the context of the Internet and World Wide Web, use a wide variety of techniques to improve the usefulness of the search results. These techniques address many aspects of search engine design, from the basic indexing methods and document representation, through query analysis and modification, to relevance ranking and result presentation, methodologies too numerous to fully catalog here.

[0004] Specifically, various methods are used to organize the results of the search for presentation to the user. Search results can be displayed in order, for example, according to a relevancy determination given the initial search parameters, in chronological order, or according to proximity to a particular geographic location. Typically, search results are a list of links to web pages where relevant information can be found. Each webpage with relevant information is typically represented once in the list of search results, regardless of the amount of information presented.

SUMMARY

[0005] Embodiments of the invention provide a method, system, a computer program product, and a user interface for displaying search results to a user.

[0006] In one embodiment, a user provides a query to the system; the query contains at least one query term. The system retrieves a set of search results comprising documents that are relevant to the query term(s), where the documents have been previously identified as having at least one associated date. The system determines the scale of a timeline to display based on the range of dates and displays the timeline with a histogram graph corresponding to the number of dates in the search results at points along the timeline. The search results can be displayed with snippets surrounding the dates, rather than on the query matches. The user can navigate the result set using the displayed timeline. For example, the user can select a section of the timeline via a user interface to expand to show a finer scale version of the histogram for that section and the results that correspond to dates in that section.

[0007] In another embodiment, the system retrieves a set of search results comprising documents that are relevant to the query terms(s), where the documents have been previously identified as having at least one associated geographic location. The search results can be displayed with snippets surrounding the geopoints, rather than on the query matches. The system determines the scale of map to display based on the geographic range of locations and displays the map with symbols at the locations corresponding to the geographic locations in the search results. The user can navigate the map via pan and zoom controls. The user can select a document to view by selecting the corresponding symbol on the map. Alternatively, the user can refine the query by selecting a symbol on the map. The system will then execute the search based on the refined query terms.

[0008] The present invention has various embodiments, including as a computer implemented process, as computer apparatuses, as integrated circuits, and as computer program products that execute on general or special purpose processors. The features and advantages described in this summary and the following detailed description are not all-inclusive. Many additional features and advantages will be apparent to one of ordinary skill in the art in view of the drawings, detailed description, and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 illustrates a generalized system architecture for a search engine system in accordance with one embodiment.

[0010] FIG. 2 is a flow chart illustrating a method of displaying a graph in accordance with one embodiment.

[0011] FIG. 3A is an illustration of an example user interface for navigating search results represented on a timeline in accordance with one embodiment.

[0012] FIG. 3B is an illustration of another example of a user interface for navigating search results presented on a timeline in accordance with one embodiment.

[0013] FIG. 4 is an illustration of a user interface for navigating search results represented on a timeline, the timeline displaying a decade date range, in accordance with one embodiment.

[0014] FIG. 5 is an illustration of a user interface for navigating search results represented on a timeline, the timeline displaying a one year date range, in accordance with one embodiment.

[0015] FIG. 6 is an illustration of a user interface for navigating search results presented on a geographical map in accordance with one embodiment.

[0016] FIG. 7 is an illustration of a user interface for navigating search results presented on a geographical map with a pop up bubble displaying search results from a refined search.

[0017] FIG. 8 is an illustration of yet another example user interface for navigating search results presented on a timeline in accordance with one embodiment.

[0018] FIG. 9 is a flow chart illustrating a method of displaying refined search results in accordance with one embodiment.

[0019] The figures depict embodiments of the present invention for purposes of illustration only. One skilled in the art will readily recognize from the following discussion that alternative embodiments of the structures and methods illustrated herein may be employed without departing from the principles of the invention described herein.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0020] FIG. 1 presents a diagram illustrating a system that displays search results on a one or two dimensional graph such as a timeline or a map, in accordance with an embodiment of the invention. A user operates a browser 104 located on a client 103. Client 103 can generally include any node on a network including computational capability and including a mechanism for communicating across the network. The client 103 can be any type of client, including any type of computer (e.g., desktop computer, workstation, notebook, mainframe, terminal, etc.), handheld device (personal digital assistant, cellular phone, etc.), embedded computation device, ubiquitous computation device, or the like. The client device 103 need only have the capability to communicate over a network (e.g. Internet, telephony, LAN, WAN, or combination thereof) with the search engine system 100. Typically, a client device 103 will also support appropriate networking applications and components, all of which are known to those of skill in the art.

[0021] Browser 104 can generally include any type of web browser capable of viewing a web site, such as the INTERNET EXPLORER™ browser distributed by the Microsoft Corporation of Redmond, Washington. Search engine system 100 can generally include any computational node including a mechanism for servicing queries from a client for computational and/or data storage resources. Note that the code and data involved in processing queries typically resides within a memory within search engine system 100. Copies of the code and data can also reside within non-volatile storage which is included in the system 100. The figure does not show a number of conventional components (e.g. network, firewalls, routers, domain name servers, load balancers, etc.) in order to not obscure the relevant details of the embodiment.

[0022] During operation, a user's client 103 can communicate with search engine system 100 to search for documents relevant to a query. The term "document" is used herein to refer to any and all types of content that can be accessed by a client over a network. Documents can be from any entity. An "entity" may be a specific person, group, organization, website, business, institution, government agency or the like. A query generally comprises one or more query terms. Query terms are words that the user believes are relevant to the user's information need.

[0023] Browser 104 can also access any document on the user's computer or LAN or other network such as the Internet (not shown). For example, browser 104 can access web pages, PDF documents, scanned books or articles, database contents, or any other format of documents belonging to a person, or any another type of entity such as a company, enterprise, community group, and so forth. For example, in FIG. 1 browser 104 accesses web site 105, which is hosted by a third-party server, or alternatively by the server associated with the search engine system 100. Web site 105 can generally have any type of web content 109. For example, web site 105 can include a personal home page, a blog, on-line encyclopedia pages, an e-commerce storefront for goods, and so forth. In addition, site 105 can include pages containing links to other sites (including entire sites, portions of a site, or individual pages).

[0024] In one embodiment of the present invention, a web crawler 190 obtains dates and corresponding events and/or geographical location information for objects or events 109 to facilitate subsequent usage in search results and search result ranking. The dates and geographic location information are stored in content server/index 170.

[0025] In order to obtain search results, user's client 103 sends a search query to the search engine system 100, which is received by a front end server 110. The front end server 110 is adapted to receive a query from the client 103 and pass it to the search engine 180. The search engine 180 processes the user's query using the content server and index 170 to obtain a set of search results that are relevant to the query term(s). The search engine 180 receives the search results and passes them to the presentation engine 188. The presentation engine 180 can include a user interface generation module, a map presentation module and a linear graph presentation module. The presentation engine formats the search results for display on a timeline view or a map view of the results as required and forwards the formatted results via the front end server 110 to the client 103. The front end server 110 is further adapted to handle the queries from multiple different clients 103 concurrently.

[0026] FIG. 2 is a flow chart illustrating a method 200 of displaying a graph in accordance with one embodiment of the invention. In step 202, the crawled data is pre-processed by the web crawler 190 or another module that can identify dates and geographic locations or geopoints from web content. For example, from the sentence "John F. Kennedy was born May 29, 1917 in Brookline, Massachusetts," a date can be extracted (year=1917, month=5, day=29) and a location can be extracted (latitude=42.332, longitude= 71.122). These dates or locations or geopoints are stored in the index 170 along with the entry or entries for the document in which they are contained. Note that in one embodiment, a plurality of dates or locations may be included in one document. Thus, one entry for a document in the index 170 may include a plurality of dates and or locations. For example, an article about the life of JFK may mention the date of his birth, the date of his inauguration, various dates marking events during his administration, and the date of his assassination. An entry for this example article in the index 170 may comprise all of these dates. In one embodiment, the character offsets in the document for the dates and locations are stored. Then, the text around the offsets is used to create the snippets displayed with the result. Note that the dates or locations associated with a document can be extracted from the content of the document, not merely from metadata about the document. In one embodiment, dates and locations can be extracted from the content of the document and from metadata.

[0027] In step 204, a query is received by the search engine system 100. The query can be formatted according to any method known in the art. For example, the query may comprise a keyword, a text string, several terms separated by Boolean operators, or the like. In one embodiment, the user sending a query indicates that he would like the results

formatted in a special way (for example, by dates or geographic locations). In another embodiment, the user does not make such an indication until after an initial query results set is displayed.

[0028] In step 206, the query results having associated dates or locations are determined. In processing the query, the search engine 180 identifies relevant documents using the content server and index 170. For each relevant document, the search engine 180 identifies which documents have associated dates or locations. For example, the document may mention dates or locations, or for example, dates or locations can be extracted from HTML anchors that point to the document. In one embodiment, this was determined in element 202. In one embodiment, only results that have associated dates or locations will be returned. In another embodiment, all relevant results are returned, regardless of whether the results have associated dates or locations.

[0029] In step 208, the presentation engine 188 formats the graph of the data. In one embodiment, the presentation engine 188 determines the scale of the graph along the time dimension. For example, if the dates within the search results occur exclusively within one decade or one year, the presentation engine 188 can format the results for display on a timeline that includes just that decade or year, respectively. In one embodiment, the time range to display is selected to be sufficiently large to encompass all dates within the results, and a scale is selected such that the entire time range can be displayed in a window of the user interface without panning or scrolling. In one implementation, the initial time range to display is chosen with less weight given to recent dates because they are so prevalent on the web. For example, if there are ten dates in the 1960's and five dates in the 2000's, the timeline may be presented as a view of just the 1960's, because the recent dates may be less relevant. In another embodiment, a default time frame and/or time scale is used. Similarly, presentation engine 188 can determine the scale of the vertical axis of the histogram of results along the timeline. In one implementation, a maximum length of a bar in the bar chart is selected to correspond with a certain number of results within one time period "bin", and all other bars are normalized according to this standard. For example, if 10 results is set to correspond to the maximum bar length, then a "bin" with 20 results would have a bar of the same maximum length, and a "bin" with 5 results would have a bar that is half as long. In another implementation, the highest number of results in a bin is used as the maximum bar length, and all others are normalized against this standard. Many other methods to determine a scale are also possible. In another embodiment, the presentation engine 188 formats a map

with the locations corresponding to search results. The presentation engine 188 may be configured to select a map scale that enables all results to be displayed on the map. Alternatively, the presentation engine 188 may be configured to select a map scale that enables a subset of the results, for example the first twenty ranked results, or a majority of the first 100 ranked results to be displayed. More details about other format options are described below with reference to the user interface figures.

[0030] In step 210, the graph of the data is displayed. The formatted results are sent from the search engine system 100 to the client 103, and displayed. Examples of displayed results in timeline format and map format are shown in the following figures.

[0031] FIG. 3A is an illustration of an example user interface 300 for navigating search results represented on a timeline in accordance with one embodiment. In this example, the user interface 300 includes a search interface 303, where a query "JFK" 303 has been entered. The user has the option of viewing the web results by selecting the "View web results" option 305, or viewing the timeline by selecting the "View timeline" option 306. In one embodiment, the timeline option is the default for the display of results. Regardless of which view of the results is displayed first, in this embodiment, the user has the option to toggle between viewing the web results and viewing the timeline by selecting option 305 or option 306 respectively. In one implementation, the web results are displayed in ranked order by relevance as it is known in the art rather than in chronological order.

[0032] In the example of FIG. 3A, a title 307 appears above the date range 310 and the timeline 312 itself. In one implementation, the title 307 includes the search terms used. The date range 310 indicates the time period of the timeline 312. The timeline 312 includes a histogram of the search results that fall within the date range 310 of the timeline 312. In the example shown in FIG. 3A, the timeline 312 provides a visualization of the distribution of the dates represented in the results set; there is a cluster of results having dates in the 1940's and a cluster of results have dates in the 1960's, with a few other dates spread throughout the century. In one embodiment, the histogram is only representative of the dates within the highest ranking results, for example twenty or 100 highest ranking results. In another embodiment, the histogram is representative of the distribution of dates relevant to the search terms for the entire set of results.

[0033] In the example of FIG. 3A, the user interface 300 also includes a list of the results 330 presented chronologically and divided according to the unit of measure of the timeline 312. In this example, the list of results 330 is divided by decade. For each result in the list,

the event 331 can be listed along with the date the event occurred 332 and a link 333 to the web site or a URL where the document with this information can be found. The user can select the link 333 to access the document. In one embodiment, the results list 330 can include a plurality of references to the same web site. For example, several of the results in FIG. 3A reference the same web site, "www.prezhist.com." Whereas conventional web results may prevent duplicate references to a document, the timeline web results can be designed to display the unique dates from all web results, and may present multiple dates from one source document. In one embodiment, all dates from all web results are displayed, regardless if a date is duplicated. In another embodiment, only the highest ranked result for any date is displayed. In yet another embodiment, the number of duplicates of dates permitted depends on the time period selected. As is described below, the user interface 300 can provide the user the ability to "drill down" within a particular section of the timeline to obtain more detail on the results within that section. Therefore, in one embodiment, no duplicates are displayed when all dates are displayed, but as the user drills down within a narrower and narrower time window, duplicates may be displayed.

[0034] FIG. 3B is an illustration of another example of a user interface for navigating search results presented on a timeline in accordance with one embodiment. In this example, options 316 for viewing the results by week, month, year, 5 years, or max are presented. The user can select an option for the detail with which to view the histogram of results along the timeline 312 and the corresponding list of results 330. In this example, the default max time period is by decade. If the user selects to view the results by a smaller unit, such weeks, months, hours, minutes, seconds, etc., the user can select the "show all" option 315 to quickly navigate back to viewing the entire timeline. The user can select a portion of the timeline to view in more or less detail as desired.

[0035] In the example shown in FIG. 3B, the user is preparing to select the decade corresponding to the 1960's 340. In one embodiment, the user can position the cursor over the time period of interest, for example, using a mouse or other pointing device, and click or otherwise select it. In one embodiment, the user's selection of a time period of interest appears as a box 341 around a portion of the timeline. In one embodiment, a single click on, for example, the 1960's 340 will cause the results for the 1960's to appear first in the results list below, as if the user had scrolled down to them. In this way, the user can interact with the timeline to navigate the list of results. In another embodiment, a user can double click on a portion of the timeline, for example one decade, to expand the timeline such that the

timeline includes only the selected date range and the results list 330 includes only results within the same time frame. In another embodiment, the user can click and drag to highlight a section of the timeline of interest. In one implementation, the highlighted section of the timeline is expanded and the corresponding results are listed in the result list 330 below.

[0036] FIG. 4 is an illustration of a user interface for navigating search results represented on a timeline 412, the timeline 412 displaying a decade date range 410, in accordance with one embodiment. The user may see this screen after having selected the 1960's from the timeline shown in FIG. 3B. If the user wants to return to viewing all results, such as shown in FIG. 3B, the user can select the "All dates" option 411. The user interface also provides the option of viewing the portion of the timeline and associated results to the left or right of the displayed portion of the timeline by selecting the left or right arrows 414. This causes the timeline to scroll to the left or right respectively and the results listed in result list 430 to correspondingly change to those represented on the currently visible portion of the timeline. As described above with reference to FIG. 3B, again, the user can select a portion of the timeline to expand to view in more detail and view results having dates corresponding to that portion of the timeline.

[0037] FIG. 5 is a generalized illustration of a user interface for navigating search results represented on a timeline 512, the timeline displaying a one year date range, in accordance with one embodiment. The user may navigate to this screen with a one year date range by selecting, for example, the year 1963 from the timeline 412 in FIG. 4. If the user wants to return to viewing results from the full decade of the 1960's, the user can select option 511. If the user wants to view results from all dates, the user can select the "All dates" option 411. The results list 530 has been generalized to demonstrate one example format for the display of the results. In this implementation, results are listed chronologically, and divided by month. In one embodiment, a maximum number of results are displayed for each time period in the results list 530. In this example, a maximum of four results are listed for each month. As discussed above, if more than four results are available in any one month, a determination is made as to which results to display. The four results with the earliest dates may be shown, or the four highest ranked results may be shown, or four results that are evenly spread throughout the time period might be shown, depending on the application. In one embodiment, to obtain more results for one month, the user can select the corresponding month from the timeline 512 to expand the timeline to include just dates within the month.

[0038] In the previous examples, a timeline of a century, a decade, and a year have been shown. It is also possible that the timeline be longer, for example several centuries or more, or shorter, for example a week, a day, hour, minute, second, or shorter, without departing from the principles of the invention. For example, in one embodiment, dates falling within a month or less may be displayed in a calendar format. The distribution of the dates within the month can be represented by the length of a bar or the number of symbols within each box signifying a day of the month. Alternatively or additionally, a color scheme or color scale can be used to represent the distribution of the dates within the month, or within a longer timeline.

[0039] FIG. 8 is an illustration of yet another example of a user interface for navigating search results presented on a timeline in accordance with one embodiment. In this example, the timeline 812 with a line graph histogram appears above a distribution 818 of block markers corresponding to search results, such as marker 881 and 882. The block markers in distribution 818 correspond to search results presented in the list 830. In this example, each result, such as result 831 and 832 comprises a date and a description of an event that occurred on the date. In one embodiment, certain important dates and events are presented in bold, or otherwise highlighted or made distinguishable from other dates and events. For example, dates that occur with the highest frequency in the results can be emphasized. In this example, the birth date 831 and death date 832 are presented in bold. Also in this example, the markers corresponding to the birth date 881 and death date 882 in distribution 818 are labeled. In one embodiment, the user can select one of the search results 830, for example by clicking on the date or the description, to access the document from which the information was extracted.

[0040] Referring now to FIG. 6, there is shown an illustration of a user interface 600 for navigating search results 630 presented on a geographical map 660 in accordance with one embodiment. In this example, the user interface 600 includes a search interface 603, where a search for "civil war" has been entered. The user can enter non-geographical search terms, i.e., search terms that do not explicitly specify a unique location or place such as "civil war", "state capitols", or "Marilyn Monroe", and view the locations extracted from the search results on a map. The user has the option of viewing the web results by selecting the "View web results" option 605, or viewing a timeline by selecting the "View timeline" option 306, or viewing a map by selecting the "View map" option 608. In one embodiment, the map option is the default for the display of results. Regardless of which view of the results is

displayed first, the user has the option to toggle between a viewing the web results, the timeline, and the map by selecting option 605, 606, or 608 respectively. In one implementation, the order of displayed results and/or the result set may be different depending what option 605, 606, or 608 is selected. In one embodiment, the timeline view and the map view of results is visible to the user on the same page. For example, a user may enter a query for "Rolling Stones Concerts" and be able to view the locations of concerts on a map and the dates of concerts on a timeline, and be able to link to any of the documents from which the dates and locations were extracted, all from a single page.

[0041] In one embodiment, the user interface 600 also includes an option 609 to "Link to this page." The user can select this option or button to generate a hyperlink to place on an external web page that links to the current page with the current view of the search results and graphical presentation of them.

[0042] In the example of FIG. 6, a title 607 appears above the list of results 630 and the map 660. In one implementation, the title 607 includes the search terms used. Below the title, a list of results 630 are displayed in ranked order. For each result in the list, the event or object title 631 can be listed along with the geographic location 632 and a link 633 to the web site where the document with this information can be found. Each result in the result list 630 has a corresponding marker 639, which is placed at the respective location 669 on the map 660 referenced in the result. In one embodiment, each marker is distinctive. In this example, the markers resemble push pins with letters on them; alternatively, they can be any shape, symbol, and color with any identifying feature that distinguishes them from each other. For example, the markers can be different colors from one another, be different shapes, have different numbers or words, or have any other distinguishing characteristic or combination of distinguishing characteristics. In one embodiment, certain important locations or the markers at those locations are presented in bold, or otherwise highlighted or made distinguishable from other locations or markers. For example, locations that occur with the highest frequency in the results can be emphasized.

[0043] In one embodiment, the results list 630 can include a plurality of references to the same web site. For example, several of the results in FIG. 6 reference the same web site, "www.cr.nps.gov." As discussed above, whereas conventional web results may prevent duplicate references to a document, the map 660 of results can be designed to display the unique locations from all web results, and may present multiple locations from one source document. In one embodiment, all locations from all results 630 are displayed and mapped,

regardless if a location is duplicated. In other embodiments, only the highest ranked or the most frequent result for any location is displayed. In yet another embodiment, the amount of duplicates of locations permitted depends on the scale of the map. As is described below, the user interface 600 can provide the user the ability to zoom within a particular section of the map to obtain more detail on the results within that section. Therefore, in one embodiment, no duplicates are displayed when large area is mapped, but as the user zooms within a narrower area, duplicates may be displayed.

[0044] The map 660 provides a visualization of the distribution of the geographic locations referenced in the result set. In this example, there is a cluster of locations in New England, with a few other locations spread to the north and south. In one embodiment, the map is only representative of the locations within the highest ranking results, for example twenty or 100 highest ranking results. In another embodiment, the map is representative of the distribution of locations relevant to the search terms for the entire set of results. The map 660 includes a smaller inset map 661 to orient the user. The outlined area 662 within the inset map 661 is representative of the location of the area within map 660 relative to larger landmarks, such as North America. The user also has the option of displaying the map 660 as a map as shown in FIG. 6 by selecting button 663, or displaying the map 660 using satellite photograph data (not shown) by selecting button 664, or displaying the map 660 using a hybrid (not shown) of traditional map symbols and satellite photograph data by selecting button 665.

[0045] A user can navigate the map 660 using pan control 666, and the zoom control 667. To view sections of the map to the north, south, east, or west, the user can press the corresponding arrow of the pan control 666. Alternatively, the user can click on the map 660 and drag the map in any direction. To zoom in on a section of the map, the user can select the plus button of the zoom control 667 or alternatively, drag the slider 668 of the zoom control up, or click along the line above the slider 668. In order to zoom out, the user can select the minus button of the zoom control 667 or alternatively, drag the slider 668 of the zoom control down, or click along the line below the slider 668.

[0046] In one embodiment, a user can click on mapped marker, such as marker 669, to select the corresponding document from result list 630 to view. In one embodiment, when the user hovers a cursor over a marker, a pop-up bubble appears that displays the corresponding result from the list of results 630. In another embodiment, a single click or a double click by the user causes a popup bubble to appear.

[0047] FIG. 7 shows an example of a pop-up bubble 770 corresponding to marker B that marks the location of the "Gettysburg Campaign" result 737 from the results list. In this embodiment, the user can execute a refined search by clicking on a marker on the map 660. In this example, the user first searched for "civil war". However, after seeing the mapped results and the results list, the user desired more information related to one of the search results, in this case, search result 737. Rather than entering a new search query, the user can click or otherwise select the marker at the location of the result of interest to add terms to the search query and execute the refined query. In one embodiment, the terms added are from the name of the object or location or event that occurred at the location marked on the map (e.g., a search for [civil war battle of Gettysburg]). In another embodiment, the location is added as a search term (e.g., a search for [civil war Gettysburg, Pennsylvania]). The results 771, 772 from the refined search appear in the bubble 770. In one embodiment, only a few of the top ranked results appear in the bubble, however, any number of results can be displayed. The user can select one of the search results 771, 772 to view the corresponding document or can close the bubble by selecting button 773.

[0048] FIG. 9 is a flow chart illustrating a method 900 of displaying refined search results in accordance with one embodiment. In step 902, a selection of a result is received from the user, for example by the user clicking on the result, on the text of the result in the results list 630, or on the marker corresponding to the result on the map 660. In step 904, the terms to add to the query are determined. For example, the name of the location that was extracted from the document represented by the selected result can be added as a term in the refined query. In step 906, the results of the refined query are determined. In one embodiment, the refined query is sent to the search engine asynchronously, for example using AJAX. Then, in step 908, the results of the refined query are displayed to the user.

[0049] The above description is included to illustrate the operation of the embodiments and is not meant to limit the scope of the invention. From the above discussion, many variations will be apparent to one skilled in the relevant art that would yet be encompassed by the spirit and scope of the invention. Furthermore, several figures are presented as screen shots depicting examples of the user interface as it might appear on a display screen or other output device. The particular screen layouts, appearance, and terminology as depicted and described herein, are intended to be illustrative and exemplary, and in no way limit the scope of the invention as claimed.

[0050] Those of skill in the art will also appreciate that the invention may be practiced in other embodiments. First, the particular naming of the components, capitalization of terms, the attributes, data structures, or any other programming or structural aspect is not mandatory or significant, and the mechanisms that implement the invention or its features may have different names, formats, or protocols. Further, the system may be implemented via a combination of hardware and software, as described, or entirely in hardware elements. Also, the particular division of functionality between the various system components described herein is merely exemplary, and not mandatory; functions performed by a single system component may instead be performed by multiple components, and functions performed by multiple components may instead performed by a single component.

[0051] Some portions of the above description present the features of the present invention in terms of methods and symbolic representations of operations on information. These descriptions and representations are the means used by those skilled in the data processing arts to most effectively convey the substance of their work to others skilled in the art. These operations, while described functionally or logically, are understood to be implemented by computer programs. Furthermore, it has also proven convenient at times, to refer to these arrangements of operations as modules or by functional names, without loss of generality.

[0052] Unless specifically stated otherwise as apparent from the above discussion, it is appreciated that throughout the description, discussions utilizing terms such as "displaying" or the like, refer to the action and processes of a computer system, or similar electronic computing device, that manipulates and transforms data represented as physical (electronic) quantities within the computer system memories or registers or other such information storage, transmission or display devices.

[0053] Certain aspects of the present invention include process steps and instructions described herein in the form of a method. It should be noted that the process steps and instructions of the present invention could be embodied in software, firmware or hardware, and when embodied in software, could be downloaded to reside on and be operated from different platforms used by real time network operating systems.

[0054] The present invention also relates to an apparatus for performing the operations herein. This apparatus may be specially constructed for the required purposes, or it may comprise a general-purpose computer selectively activated or reconfigured by a computer program stored on a computer readable medium that can be accessed by the computer. Such

a computer program may be stored in a computer readable storage medium, such as, but is not limited to, any type of disk including floppy disks, optical disks, CD-ROMs, magnetic-optical disks, read-only memories (ROMs), random access memories (RAMs), EPROMs, EEPROMs, magnetic or optical cards, application specific integrated circuits (ASICs), or any type of media suitable for storing electronic instructions, and each coupled to a computer system bus. Furthermore, the computers referred to in the specification may include a single processor or may be architectures employing multiple processor designs for increased computing capability.

[0055] The methods and operations presented herein are not inherently related to any particular computer or other apparatus. Various general-purpose systems may also be used with programs in accordance with the teachings herein, or it may prove convenient to construct more specialized apparatus to perform the required method steps. The required structure for a variety of these systems will be apparent to those of skill in the art, along with equivalent variations. In addition, the present invention is not described with reference to any particular programming language. It is appreciated that a variety of programming languages may be used to implement the teachings of the present invention as described herein, and any references to specific languages are provided for enablement and best mode of the present invention.

[0056] The present invention is well suited to a wide variety of computer network systems over numerous topologies. Within this field, the configuration and management of large networks comprise storage devices and computers that are communicatively coupled to dissimilar computers and storage devices over a network, such as the Internet.

[0057] Finally, it should be noted that the language used in the specification has been principally selected for readability and instructional purposes, and may not have been selected to delineate or circumscribe the inventive subject matter. Accordingly, the disclosure of the present invention is intended to be illustrative, but not limiting, of the scope of the invention, which is set forth in the following claims.

WHAT IS CLAIMED IS:

1. A computer-implemented method of displaying query results on a timeline, comprising:

receiving a search query;

determining query results in accordance with the received search query, each query result mentioning an associated date;

formatting a histogram graph of the dates of the results; and

displaying the histogram graph along a timeline.

2. The method of claim 1, further comprising displaying the query results.

3. The method of claim 2, wherein a result having the highest frequency is displayed in a style different from other results.

4. The method of claim 2, wherein results mentioning associated dates of particular importance are displayed in a predetermined style different from the rest of the results.

5. The method of claim 2, wherein the query results are displayed along with a URL of a result web site.

6. The method of claim 2, wherein time-ordered short descriptions of the associated dates are displayed with the query results.

7. The method of claim 1, further comprising displaying a list of dates and descriptions.

8. The method of claim 1, further comprising processing crawled web pages to determine which crawled web pages mention an associated date.

9. The method of claim 1, wherein the associated date of a result is extracted from the text of the result.

10. The method of claim 1, wherein a snippet around the associated date of a result is extracted from the result.

11. The method of claim 1, wherein the query results refer to documents on the user's local computer.

12. The method of claim 1, wherein the query results refer to documents within the local area network.

13. The method of claim 1, wherein the query results refer to documents on the World Wide Web.

14. The method of claim 1, wherein at least one query result has a plurality of associated dates and at least two of the associated dates are represented in the histogram graph of the dates.

15. The method of claim 1, wherein formatting comprises determining a date range and a scale of the timeline.

16. The method of claim 1, wherein formatting comprises determining a scale of the histogram graph.

17. The method of claim 1, further comprising:

receiving a selection of a portion of the timeline; and

displaying the selected portion of the timeline in greater detail.

18. The method of claim 17, wherein displaying the selected portion of the timeline in greater detail comprises expanding the selected portion of the timeline.

19. The method of claim 1, further comprising:

receiving a selection of a portion of the timeline; and

displaying the selected portion of the timeline in lesser detail.

20. A computer-implemented method for displaying query results on a map, comprising:

receiving a non-geographic search query;

determining query results in accordance with the received search query, each result having an associated location;

formatting a map of the locations of the results, each location on the map identified by a marker; and

displaying the map with the markers.

21. The method of claim 20, further comprising displaying the query results.

22. The method of claim 21, wherein the query results are displayed along with a URL of a result web site.

23. The method of claim 21, wherein short descriptions of the associated locations are displayed with the query results.

24. The method of claim 21, wherein displaying the query results comprises displaying the query results with the associated locations and markers.

25. The method of claim 20, further comprising processing crawled web pages to determine which crawled web pages mention an associated location.

26. The method of claim 20, wherein a name of the associated location of a result is extracted from the result.

27. The method of claim 20, wherein a geopoint of the associated location of a result is extracted from the result.

28. The method of claim 20, wherein a snippet around the associated location of a result is extracted from the result.

29. The method of claim 20, wherein the query results refer to documents on the user's local computer.

30. The method of claim 20, wherein the query results refer to documents within the local area network.

31. The method of claim 20, wherein the query results refer to documents on the World Wide Web.

32. The method of claim 20, wherein at least one query result has a plurality of associated locations and at least two of the associated locations identified by markers on the map.

33. The method of claim 20, wherein formatting comprises determining a scale of the map.

34. The method of claim 20, wherein each marker is distinctive.

35. A user interface for presenting search results on a timeline, the interface comprising:

a list of search results, each result having an associated date, the list of search results in order by the associated date; and

a histogram of the dates of the results presented on a timeline.

36. The user interface of claim 35, further comprising a button for generating a hyperlink, for placement on an external web page, to a view of the list of search results and the histogram of the dates of the results presented on a timeline.

37. The user interface of claim 35, wherein each result comprises a URL of a web page associated with the result.

38. The user interface of claim 35, wherein each result comprises a description of a web page associated with the result.

39. The user interface of claim 35, wherein portions of the timeline are selectable, and wherein selecting a portion of the timeline causes an expansion of the portion.

40. The user interface of claim 35, wherein the associated date of each result is displayed in the list of search results.

41. The user interface of claim 35, wherein the timeline spans one selected from a group consisting of a century, a decade, a year, a month, a week, and a day.

42. A user interface for navigating search results on a map, the interface comprising:

a list of search results, each result having an associated location and an associated marker; and

a map of the locations of the results, each location on the map identified by the associated marker.

43. The user interface of claim 42, further comprising a button for generating a hyperlink, for placement on an external web page, to a view of the list of search results and the map of the locations of the results.

44. The user interface of claim 42, wherein each result comprises a URL of a web page associated with the result.

45. The user interface of claim 42, wherein each result comprises a description of a web page associated with the result.

46. The user interface of claim 42, further comprising pan and zoom controls.

47. The user interface of claim 42, wherein each marker is distinctive.

48. A method of refining search results, the method comprising:

processing crawled web pages to determine which crawled web pages have an associated location;

responsive to a non-geographic search query, displaying a map of the results from the crawled web pages having an associated location, each result associated with a location on the map;

receiving a selection of a location on the map corresponding to a search result;

modifying the search query to include the selected location; and

displaying search results from the modified search query.

49. The method of claim 48, wherein the search results from the modified search query appear in a bubble connected to the selected location on the map.

50. A computer program product for displaying query results on a timeline, the computer program product stored on a computer readable medium and adapted to perform the operations of:

receiving a search query;

determining query results in accordance with the received search query, each query result mentioning an associated date;

formatting a histogram graph of the dates of the results; and

displaying the histogram graph along a timeline.

51. A computer program product for displaying query results on a map, the computer program product stored on a computer readable medium and adapted to perform the operations of:

receiving a non-geographic search query;

determining query results in accordance with the received search query, each result having an associated location;

formatting a map of the locations of the results, each location on the map identified by a marker; and

displaying the map with the markers.

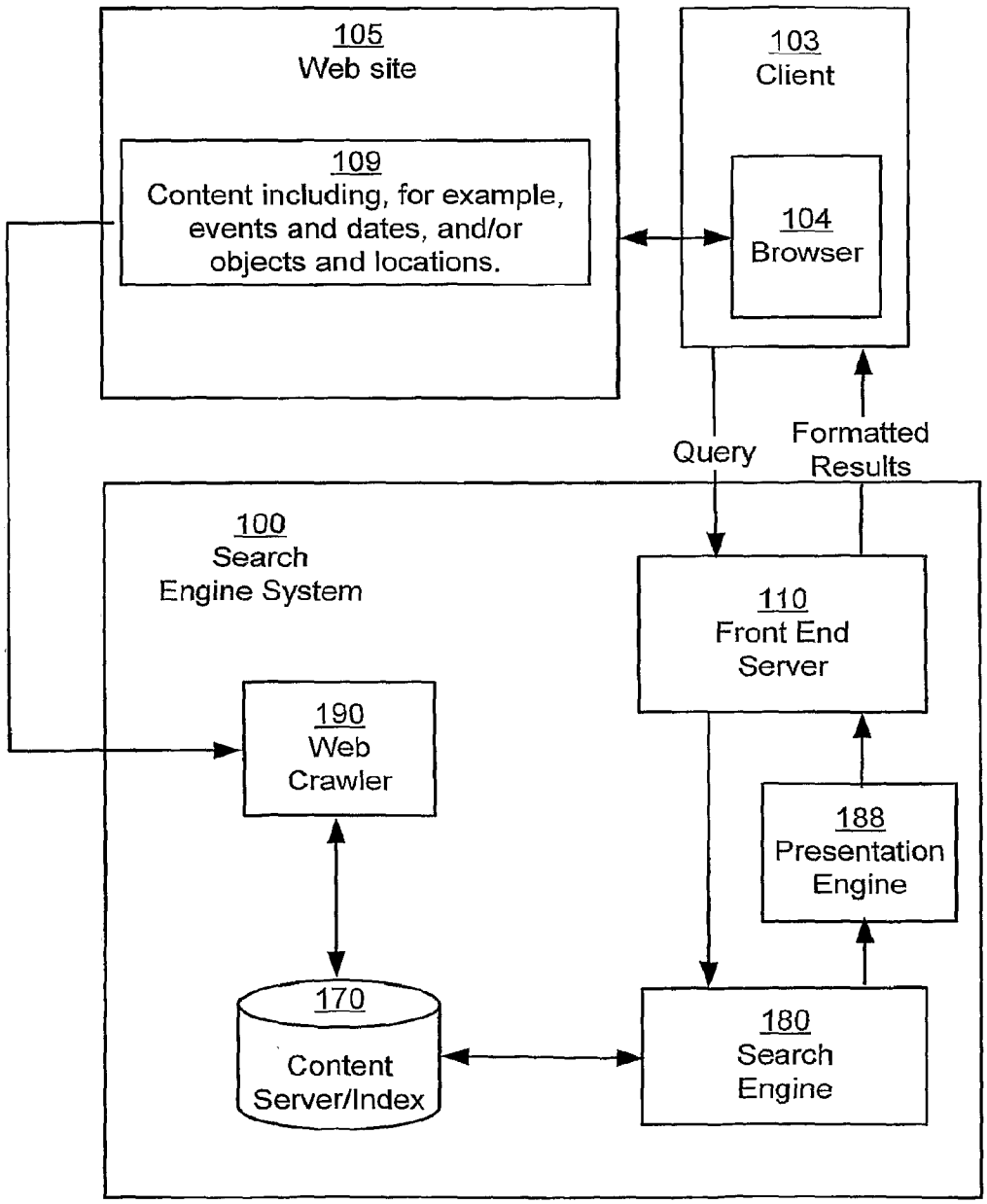

105
Web site
109
Content including, for example, events and dates, and/or objects and locations.
103
Client
104
Browser
Query
Formatted Results
100
Search Engine System
110
Front End Server
190
Web Crawler
188
Presentation Engine
170
Content Server/Index
180
Search Engine

FIG. 1

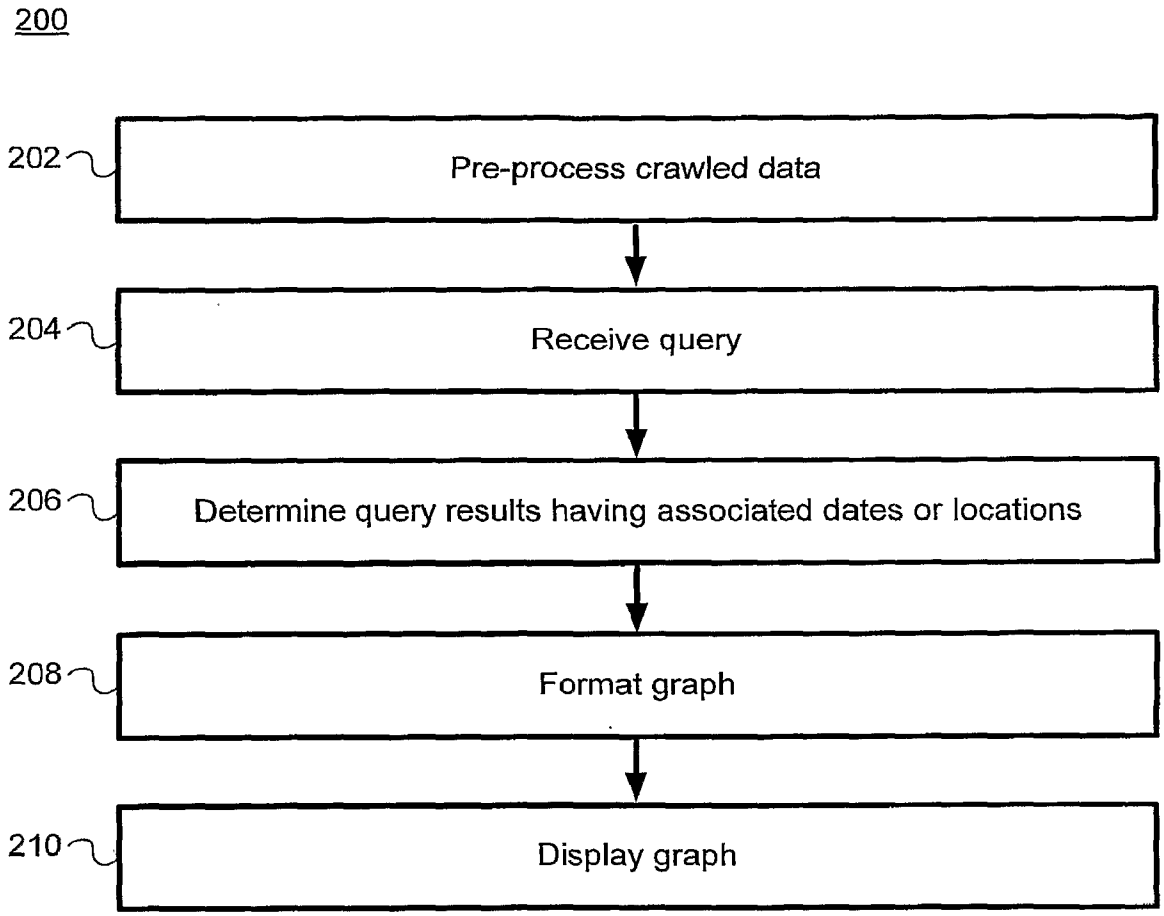

200
202
Pre-process crawled data
204
Receive query
206
Determine query results having associated dates or locations
208
Format graph
210
Display graph

FIG. 2

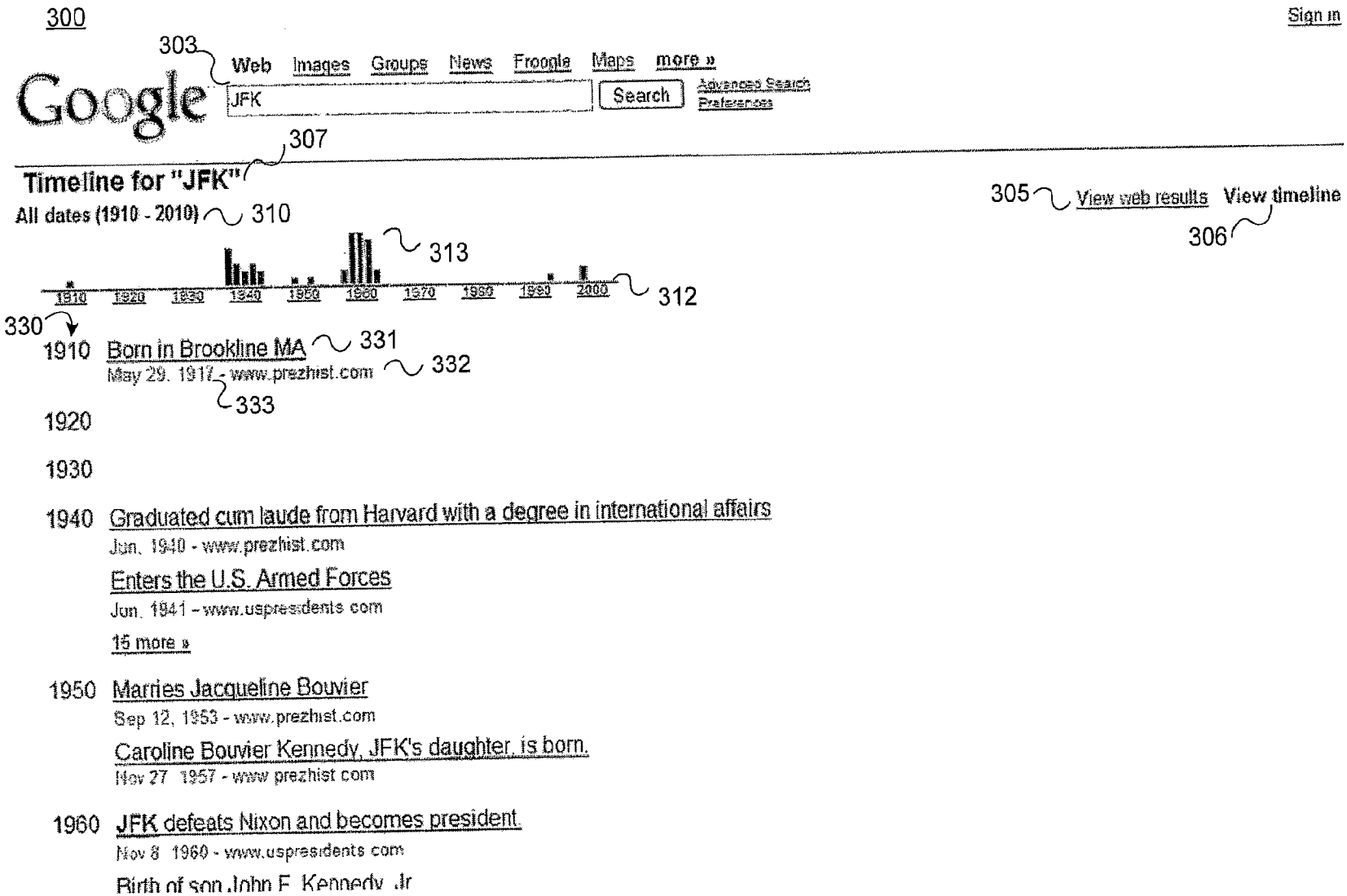

300
Sign in
303
Web Images Groups News Froogle Maps more »
Google
JFK
Search
Advanced Search
Preferences
307
Timeline for "JFK"
All dates (1910 - 2010) 310
305
View web results
View timeline
306
313
1910 1920 1930 1940 1950 1960 1970 1980 1990 2000
312
330
1910 Born in Brookline MA 331
May 29, 1917 - www.prezhist.com 332
333
1920
1930
1940 Graduated cum laude from Harvard with a degree in international affairs
Jun, 1940 - www.prezhist.com
Enters the U.S. Armed Forces
Jun, 1941 - www.uspresidents.com
15 more »
1950 Marries Jacqueline Bouvier
Sep 12, 1953 - www.prezhist.com
Caroline Bouvier Kennedy, JFK's daughter, is born.
Nov 27 1957 - www.prezhist.com
1960 JFK defeats Nixon and becomes president.
Nov 8 1960 - www.uspresidents.com
Birth of son John F. Kennedy Jr.

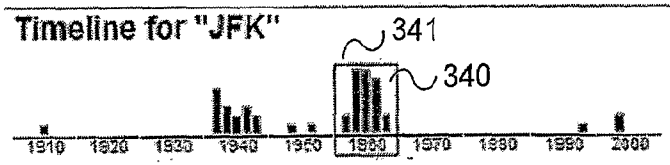
FIG. 3A

Sign in

Google Web Images Groups News Froogle Maps more »

JFK Search Advanced Search Preferences

Timeline for "JFK"



show all 315

View web results **View timeline**

316 View by. Week Month Year 5 yrs **Max**

1910 Born in Brookline MA
May 29, 1917 - www.prezhist.com

1920

1930

1940 Graduated cum laude from Harvard with a degree in international affairs
Jun, 1940 - www.prezhist.com

Enters the U.S. Armed Forces
Jun 1941 - www.uspresidents.com

15 more »

1950 Marries Jacqueline Bouvier
Sep 12, 1953 - www.prezhist.com

Caroline Bouvier Kennedy, JFK's daughter, is born.
Nov 27, 1957 - www.prezhist.com

1960 JFK defeats Nixon and becomes president
Nov 8 1960 - www.uspresidents.com

Birth of son John F. Kennedy, Jr.

FIG. 3B

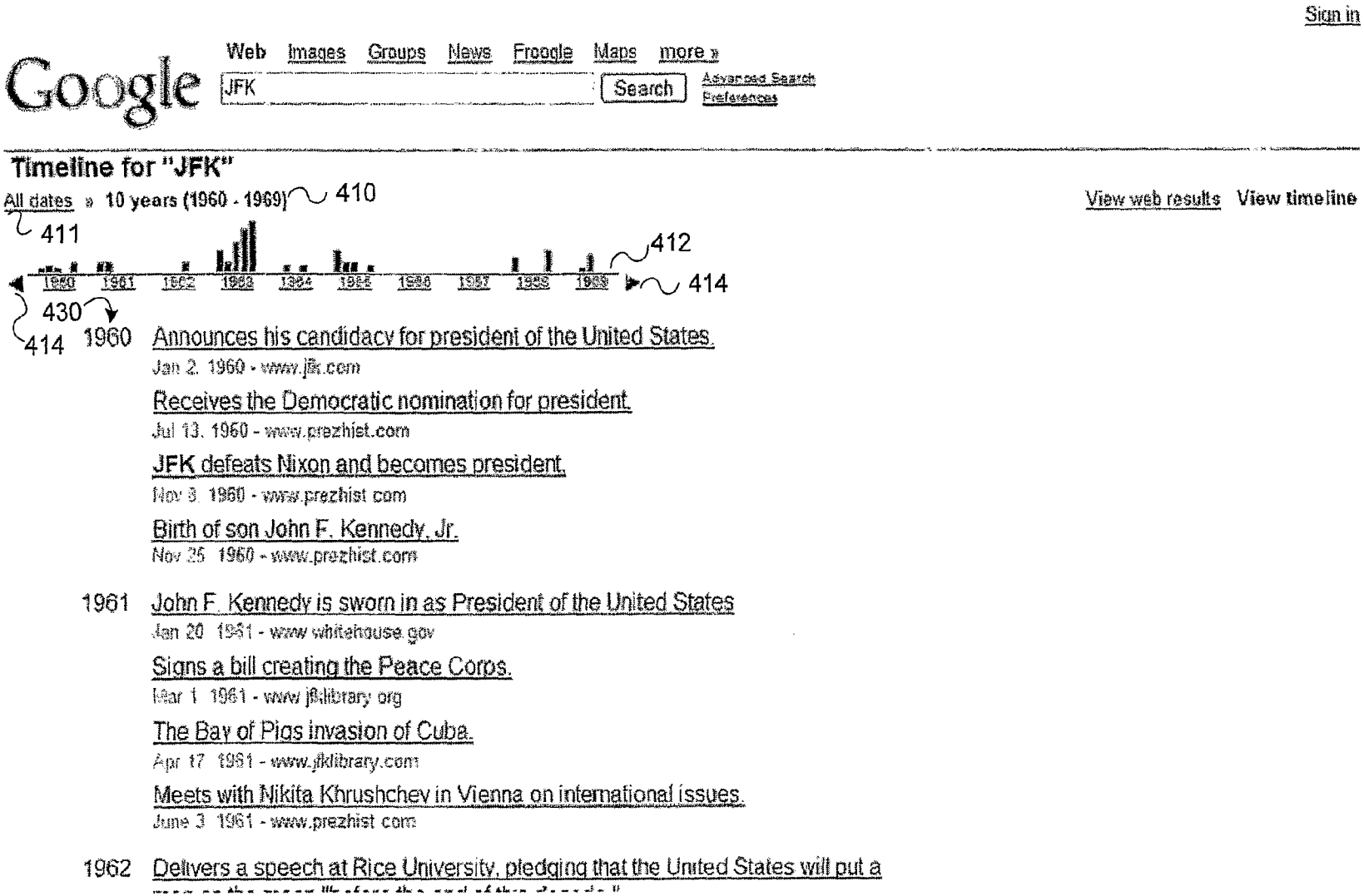

Sign in
Google
Web Images Groups News Froogle Maps more »
JFK
Search
Advanced Search
Preferences
Timeline for "JFK"
All dates » 10 years (1960 - 1969)
410
411
View web results View timeline
412
1960 1961 1962 1963 1964 1965 1966 1967 1968 1969
414
430
414
1960 Announces his candidacy for president of the United States.
Jan 2, 1960 - www.jfk.com
Receives the Democratic nomination for president.
Jul 13, 1960 - www.prezhist.com
JFK defeats Nixon and becomes president.
Nov 8, 1960 - www.prezhist.com
Birth of son John F. Kennedy, Jr.
Nov 25, 1960 - www.prezhist.com
1961 John F. Kennedy is sworn in as President of the United States
Jan 20, 1961 - www.whitehouse.gov
Signs a bill creating the Peace Corps.
Mar 1, 1961 - www.jfklibrary.org
The Bay of Pigs invasion of Cuba.
Apr 17, 1961 - www.jfklibrary.com
Meets with Nikita Khrushchev in Vienna on international issues.
June 3, 1961 - www.prezhist.com
1962 Delivers a speech at Rice University, pledging that the United States will put a

FIG. 4

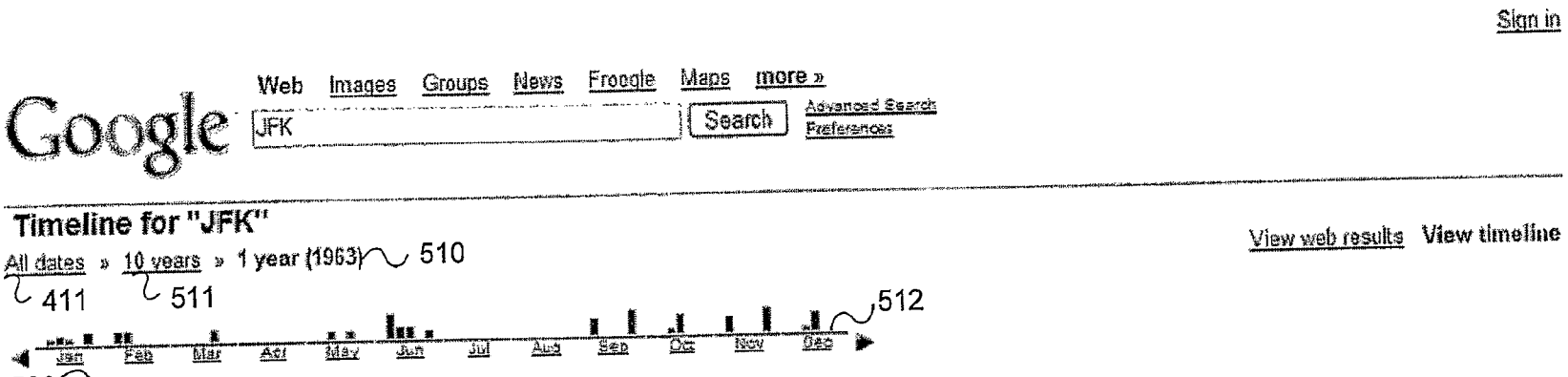
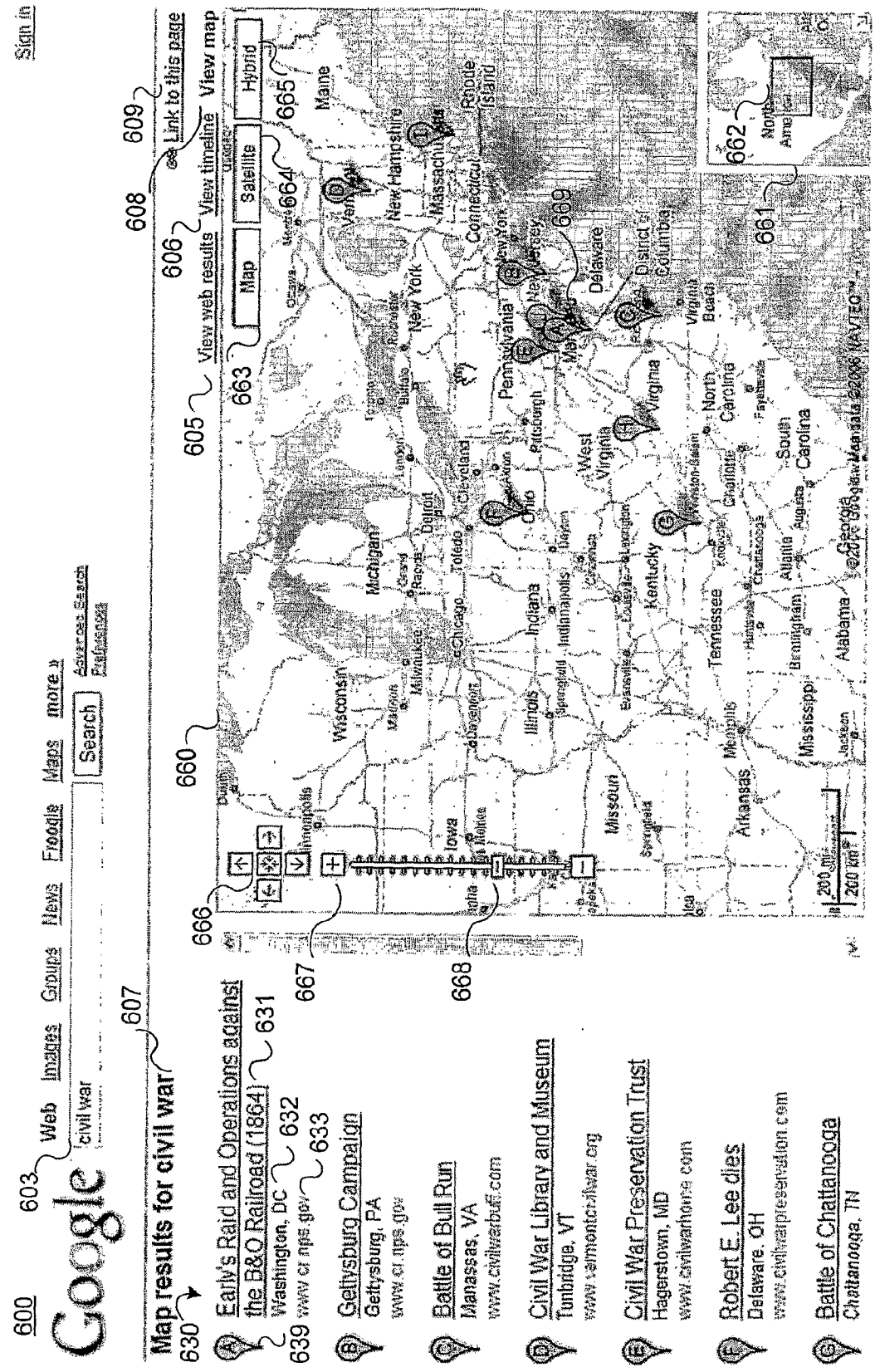

Sign in
Web Images Groups News Froogle Maps more »
Google
JFK
Search
Advanced Search
Preferences
Timeline for "JFK"
View web results View timeline
All dates » 10 years » 1 year (1963)
510
411
511
512
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
530
Jan 1963
<Title of First January 1963 Event>
<Date of first January Event> -- <link to corresponding document>
<Title of Second January 1963 Event>
<Date of Second January Event> -- <link to corresponding document>
<Title of Third January 1963 Event>
<Date of Third January Event> -- <link to corresponding document>
<Title of Fourth January 1963 Event>
<Date of Fourth January Event> -- <link to corresponding document>
Feb 1963
<Title of First February 1963 Event>
<Date of First February Event> -- <link to corresponding document>
<Title of Second February 1963 Event>
<Date of Second February Event> -- <link to corresponding document>
Mar 1963
<Title of First March 1963 Event>
<Date of First March Event> -- <link to corresponding document>

FIG. 5


600
603
Google
Web
Images
Groups
News
Froogle
Maps
more »
civil war
Search
Advanced Search
Preferences
Sign in
607
Map results for civil war
630
A Early's Raid and Operations against the B&O Railroad (1864) 631
Washington, DC 632
639 www.cr.nps.gov 633
B Gettysburg Campaign
Gettysburg, PA
www.cr.nps.gov
C Battle of Bull Run
Manassas, VA
www.civilwarbuff.com
D Civil War Library and Museum
Tunbridge, VT
www.vermontcivilwar.org
E Civil War Preservation Trust
Hagerstown, MD
www.civilwarhome.com
F Robert E. Lee dies
Delaware, OH
www.civilwarpreservation.com
G Battle of Chattanooga
Chattanooga, TN
608
609
Link to this page
View timeline
View map
606
View web results
605
663
Map
Satellite
Hybrid
664
665
660
666
667
668
669
661
662
Wisconsin
Michigan
Illinois
Indiana
Ohio
Pennsylvania
New York
Maine
Vermont
New Hampshire
Massachusetts
Rhode Island
Connecticut
New Jersey
Delaware
District of Columbia
Virginia
West Virginia
Kentucky
Tennessee
North Carolina
South Carolina
Georgia
Alabama
Mississippi
Arkansas
Missouri
Iowa
Detroit
Cleveland
Toledo
Chicago
Buffalo
Pittsburgh
Atlanta
Charlotte
Virginia Beach
Baltimore
Philadelphia
Indianapolis
Memphis
Birmingham
Augusta
Jackson
Evansville
Lexington
Louisville
Knoxville
Chattanooga
Huntsville
Fayetteville
Greensboro-Winston-Salem
Columbia
Springfield
Peoria
Rockford
Madison
Milwaukee
Grand Rapids
Lansing
Toledo
Akron
Canton
Youngstown
Erie
Rochester
Syracuse
Albany
Binghamton
Utica
Scranton
Trenton
Wilmington
Dover
Salisbury
Richmond
Norfolk
Roanoke
Charleston
Columbus
Dayton
Cincinnati
Lexington
Louisville
Nashville
Memphis
Jackson
Montgomery
Birmingham
Atlanta
Augusta
Savannah
Jacksonville
Tallahassee
Pensacola
Mobile
Biloxi
New Orleans
Baton Rouge
Shreveport
Little Rock
Fort Smith
Springfield
Kansas City
St. Louis
Des Moines
Omaha
Lincoln
Sioux Falls
Fargo
Bismarck
Minneapolis
Duluth
Green Bay
Milwaukee
Madison
Chicago
Rockford
Peoria
Springfield
Indianapolis
Fort Wayne
South Bend
Gary
Evansville
Terre Haute
Lafayette
Muncie
Kokomo
Anderson
Marion
Richmond
Hamilton
Middletown
Springfield
Dayton
Cincinnati
Columbus
Akron
Canton
Youngstown
Cleveland
Toledo
Detroit
Flint
Saginaw
Bay City
Grand Rapids
Kalamazoo
Battle Creek
Lansing
Jackson
Ann Arbor
Monroe
Port Huron
Sarnia
Windsor
Buffalo
Rochester
Syracuse
Albany
Binghamton
Utica
Scranton
Wilkes-Barre
Allentown
Bethlehem
Easton
Reading
Harrisburg
Lancaster
York
Philadelphia
Trenton
Wilmington
Dover
Salisbury
Baltimore
Washington
Richmond
Norfolk
Virginia Beach
Roanoke
Charleston
Huntington
Parkersburg
Morgantown
Wheeling
Pittsburgh
Erie
Meadville
Oil City
Franklin
Warren
Jamestown
Olean
Elmira
Corning
Binghamton
Utica
Syracuse
Rochester
Buffalo
Niagara Falls
Watertown
Plattsburgh
Burlington
Montpelier
Barre
Rutland
Bennington
Brattleboro
Keene
Concord
Manchester
Nashua
Portsmouth
Dover
Rochester
Berwick
Biddeford
Saco
Portland
Lewiston
Auburn
Augusta
Waterville
Bangor
Brunswick
Bath
Rockland
Camden
Belfast
Ellsworth
Machias
Calais
Eastport
Presque Isle
Caribou
Fort Kent
Houlton
Madawaska
Edmundston
Moncton
Saint John
Fredericton
Woodstock
Grand Falls
Campbellton
Bathurst
Miramichi
Chatham
Newcastle
Dalhousie
Edmundston
Saint John
Fredericton
Moncton
Sackville
Amherst
Truro
Halifax
Dartmouth
Bedford
Sydney
Glace Bay
New Glasgow
Pictou
Antigonish
Port Hawkesbury
Yarmouth
Digby
Annapolis Royal
Kentville
Wolfville
Windsor

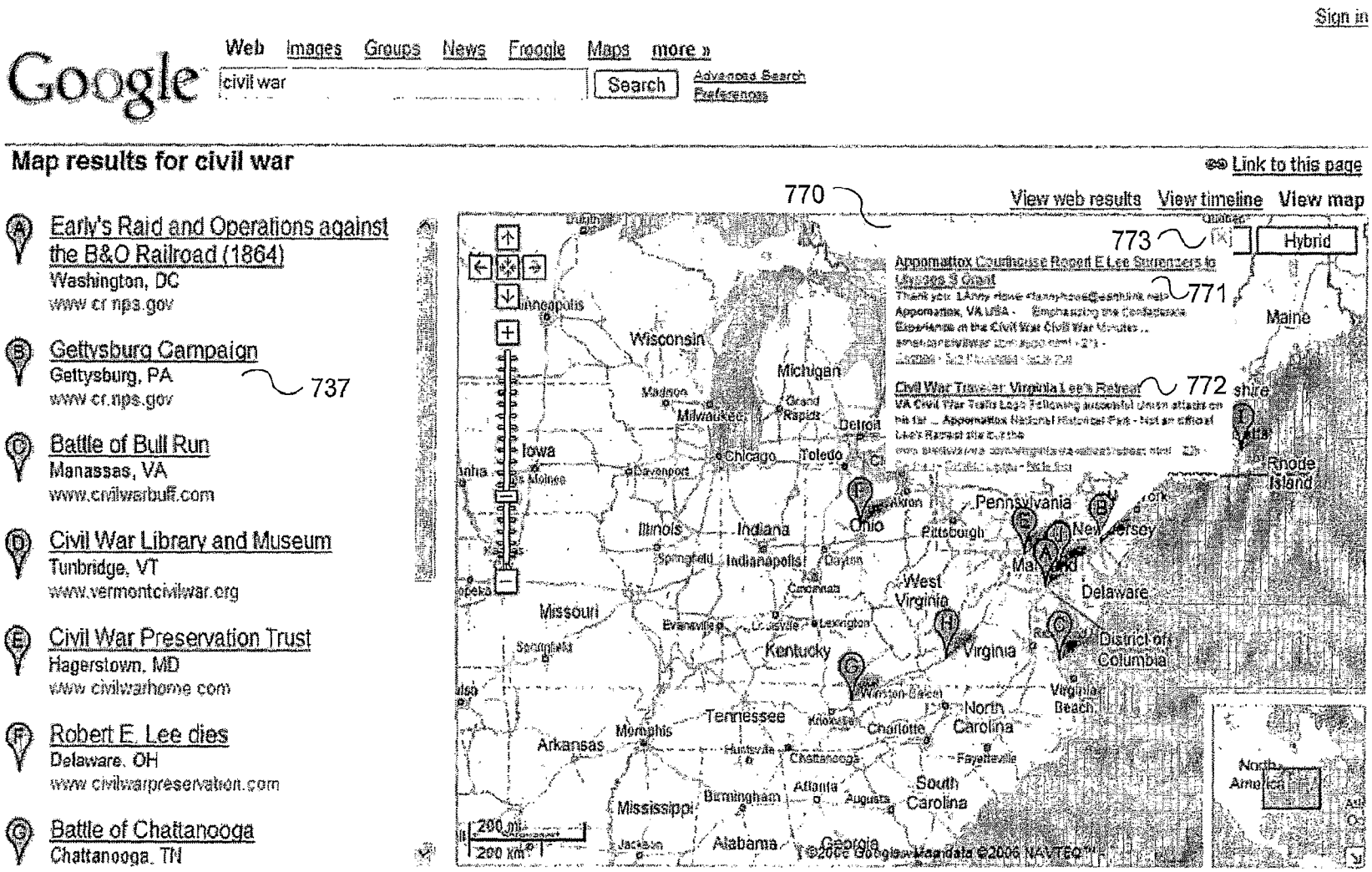

Sign in
Google
Web Images Groups News Froogle Maps more »
civil war
Search
Advanced Search
Preferences
Map results for civil war
Link to this page
770
View web results View timeline View map
773
Hybrid
771
772
737
A Early's Raid and Operations against the B&O Railroad (1864)
Washington, DC
www.cr.nps.gov
B Gettysburg Campaign
Gettysburg, PA
www.cr.nps.gov
C Battle of Bull Run
Manassas, VA
www.civilwarbuff.com
D Civil War Library and Museum
Tunbridge, VT
www.vermontcivilwar.org
E Civil War Preservation Trust
Hagerstown, MD
www.civilwarhome.com
F Robert E. Lee dies
Delaware, OH
www.civilwarpreservation.com
G Battle of Chattanooga
Chattanooga, TN
Wisconsin
Michigan
Iowa
Illinois
Indiana
Ohio
Pennsylvania
New York
Maine
Rhode Island
Missouri
Kentucky
West Virginia
Virginia
Delaware
District of Columbia
Tennessee
North Carolina
South Carolina
Arkansas
Mississippi
Alabama
Georgia
200 mi
200 km
©2006 Google - Mapdata ©2006 NAVTEQ™

FIG. 7

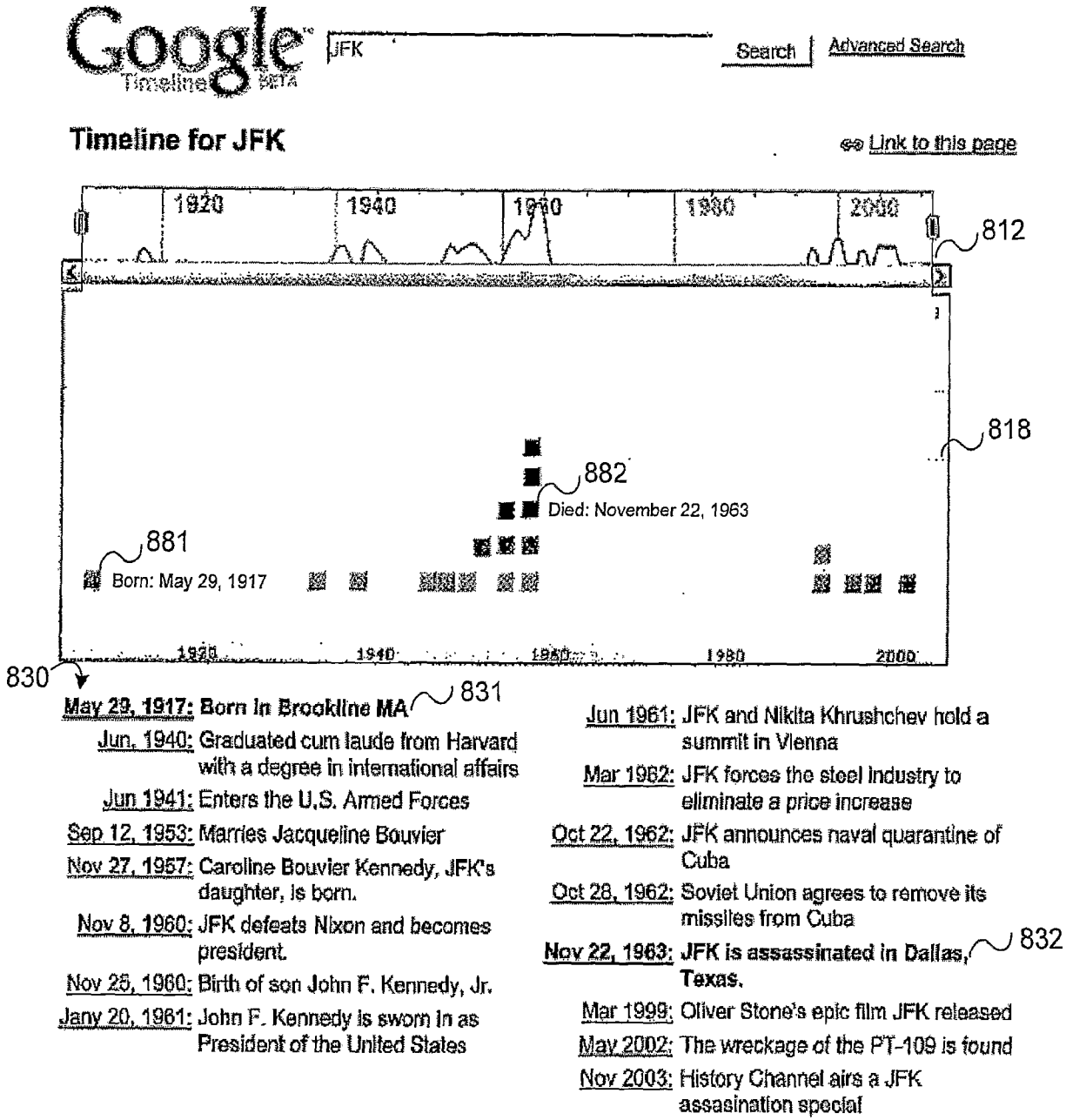

Google Timeline BETA
JFK
Search
Advanced Search
Timeline for JFK
Link to this page
1920
1940
1960
1980
2000
812
818
882
Died: November 22, 1963
881
Born: May 29, 1917
830
May 29, 1917: Born in Brookline MA
831
Jun, 1940: Graduated cum laude from Harvard with a degree in international affairs
Jun 1941: Enters the U.S. Armed Forces
Sep 12, 1953: Marries Jacqueline Bouvier
Nov 27, 1957: Caroline Bouvier Kennedy, JFK's daughter, is born.
Nov 8, 1960: JFK defeats Nixon and becomes president.
Nov 25, 1960: Birth of son John F. Kennedy, Jr.
Jany 20, 1961: John F. Kennedy is sworn in as President of the United States
Jun 1961: JFK and Nikita Khrushchev hold a summit in Vienna
Mar 1962: JFK forces the steel industry to eliminate a price increase
Oct 22, 1962: JFK announces naval quarantine of Cuba
Oct 28, 1962: Soviet Union agrees to remove its missiles from Cuba
Nov 22, 1963: JFK is assassinated in Dallas, Texas.
832
Mar 1999: Oliver Stone's epic film JFK released
May 2002: The wreckage of the PT-109 is found
Nov 2003: History Channel airs a JFK assasination special

FIG. 8

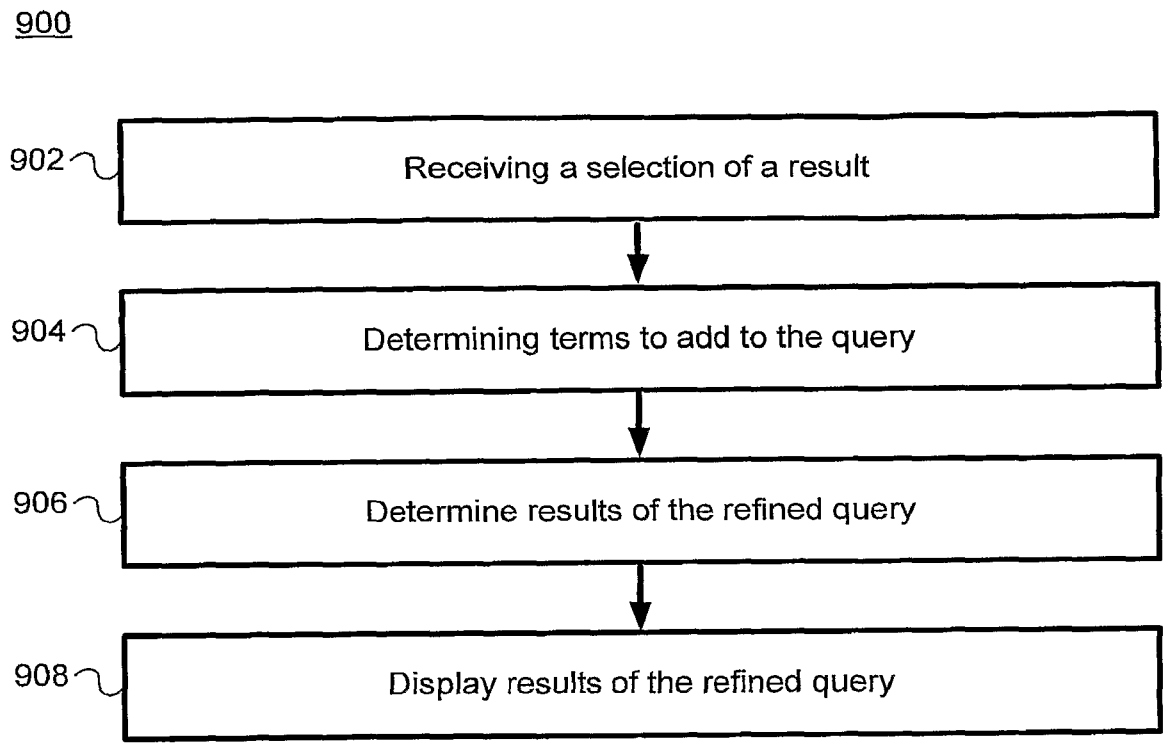

900
902
Receiving a selection of a result
904
Determining terms to add to the query
906
Determine results of the refined query
908
Display results of the refined query

FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 07/61157

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 7/00 (2007.01)
USPC - 707/102
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
USPC - 707/102

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 707/3, 7, 100, 101, 102 – text search, see search terms below

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWEST(PGPB,USPT,USOC,EPAB,JPAB); DialogPRO(Engineering); Google Scholar

Search Terms Used: -- continued on p.8 of this form --

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2006/0173824 A1 (BENSKY et al.) 03 August 2006 (03.08.2006), entire document especially Figs 1, 2B, 7A, 7B, 12, 13, 14A, 14B; para [0036]-[0037], [0040], [0054], [0056], [0073], [0095], [0102], [0105], [0135]-[0136], [0140], [0146]-[0147], [0153]-[0154].	1-4, 6, 7, 9-19, 35, 37-41 and 50 --- 5, 8, 36 and 49
X --- Y	US 2003/0158855 A1 (FARNHAM et al.) 21 August 2003 (21.08.2003), entire document especially Figs 1, 3, 9, 10, 11, 12, 18, 19; Table 1B; para [0026]-[0027], [0032]-[0033], [0035], [0037], [0039], [0041], [0043], [0045], [0066]-[0067], [0074], [0078]-[0079], [0085]-[0089], [0091], [0097], [0113]-[0115], [0123]-[0124], [0157].	20-34, 42, 44-48 and 51 --- 5, 8, 43 and 49
Y	CLARKE, Tina. FrontPage 2002 Tutorials - Adding functionality to your website with FrontPage 2002 Part II ~ Navigation. ABC ~ All 'Bout Computers, Vol. 11, April 2002 [retrieved on 2007-10-03] Retrieved from the Internet: <URL: accessfp.net/frontpagenavigation.htm>, especially page 1 of 8 and page 2 of 8.	36 and 43

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
03 October 2007 (03.10.2007)	15 FEB 2008

Name and mailing address of the ISA/US	Authorized officer:
Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 07/61157

Continuation of B. FIELDS SEARCHED:

Search Terms Used:

PubWEST – timeline, time, line, chronologic or chronological, query, date or location or position or coordinate or latitude or longitude, histogram or map or graph, dimension or dimensional, scale or scaling, detail, greater or lesser or less or more or narrow, or broad, crawl, pan or zoom, search or query, result, display or displaying or view, pop, up, bubble, marker or symbol or ID or identifier, marker or symbol or "(ID)" or identifier

DialogPRO(Engineering) and Google Scholar -- button, generate hyperlink, place on external web site