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(54) **USING NATURAL SEARCH CLICK EVENTS TO OPTIMIZE ONLINE ADVERTISING CAMPAIGNS**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,041,326	A	3/2000	Amro et al.	
6,314,420	B1	11/2001	Lang et al.	
6,397,212	B1	5/2002	Biffar	
6,490,579	B1	12/2002	Gao et al.	
6,801,909	B2 *	10/2004	Delgado et al.	707/4
6,850,934	B2	2/2005	Bates et al.	
6,898,592	B2	5/2005	Peltonen et al.	
6,999,959	B1	2/2006	Lawrence et al.	
7,072,888	B1	7/2006	Perkins	
7,107,261	B2	9/2006	Farrett	
7,386,572	B2 *	6/2008	Kramer	707/104.1
7,725,464	B2 *	5/2010	Grubb et al.	707/723

2002/0052873	A1 *	5/2002	Delgado et al.	707/7
2004/0267700	A1 *	12/2004	Dumais et al.	707/2
2004/0267730	A1 *	12/2004	Dumais et al.	707/3
2005/0131884	A1	6/2005	Gross et al.	
2005/0234895	A1 *	10/2005	Kramer	707/3
2006/0069617	A1 *	3/2006	Milener et al.	705/14
2007/0011039	A1 *	1/2007	Oddo	705/10
2007/0061363	A1 *	3/2007	Ramer et al.	707/104.1
2007/0150353	A1 *	6/2007	Krassner et al.	705/14

(Continued)

FOREIGN PATENT DOCUMENTS

WO WO 2007/025130 A2 3/2007

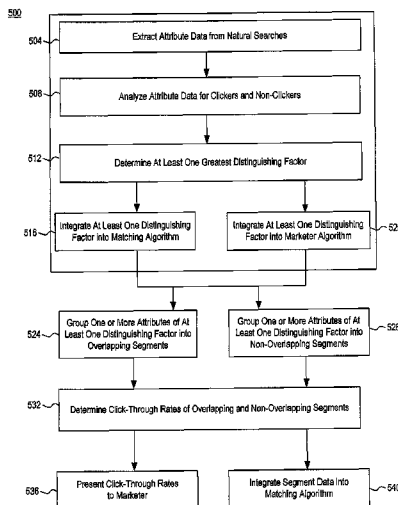
(Continued)

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(57) **ABSTRACT**

A method is described for augmenting sponsored search results in a search engine, which includes extracting attribute data from a plurality of natural searches for a search term linked to a plurality of uniform resource locators (URLs), analyzing the attribute data of one or more attributes for clickers and non-clickers to determine at least one greatest distinguishing factor between the clickers and non-clickers, and integrating the at least one greatest distinguishing factor into a matching algorithm used by the search engine to rank order and display a plurality of the most relevant ads corresponding to the plurality of URLs in response to a search for the term. The method may also integrate the at least one greatest distinguishing factor into a marketer algorithm to enable a marketer of a URL to strategically choose a search term, along with the at least one greatest distinguishing factor, on which to bid.

23 Claims, 7 Drawing Sheets



U.S. PATENT DOCUMENTS

2007/0192164 A1* 8/2007 Nong et al. 705/10
2007/0214050 A1* 9/2007 Schoen et al. 705/14
2007/0260597 A1* 11/2007 Cramer 707/5
2007/0260624 A1* 11/2007 Chung et al. 707/101
2008/0059258 A1* 3/2008 Lee 705/7
2008/0183558 A1* 7/2008 Koran 705/10
2008/0228571 A1* 9/2008 Koran 705/14
2008/0250033 A1* 10/2008 Agarwal et al. 707/100
2009/0106100 A1* 4/2009 Mashinsky 705/14

2009/0193014 A1* 7/2009 Menezes et al. 707/5
2009/0228353 A1* 9/2009 Achan et al. 705/14
2009/0287682 A1* 11/2009 Fujioka et al. 707/5
2010/0106703 A1* 4/2010 Cramer 707/706
2010/0169175 A1* 7/2010 Koran 705/14.45

FOREIGN PATENT DOCUMENTS

WO WO 2007/025338 A1 3/2007

* cited by examiner

100

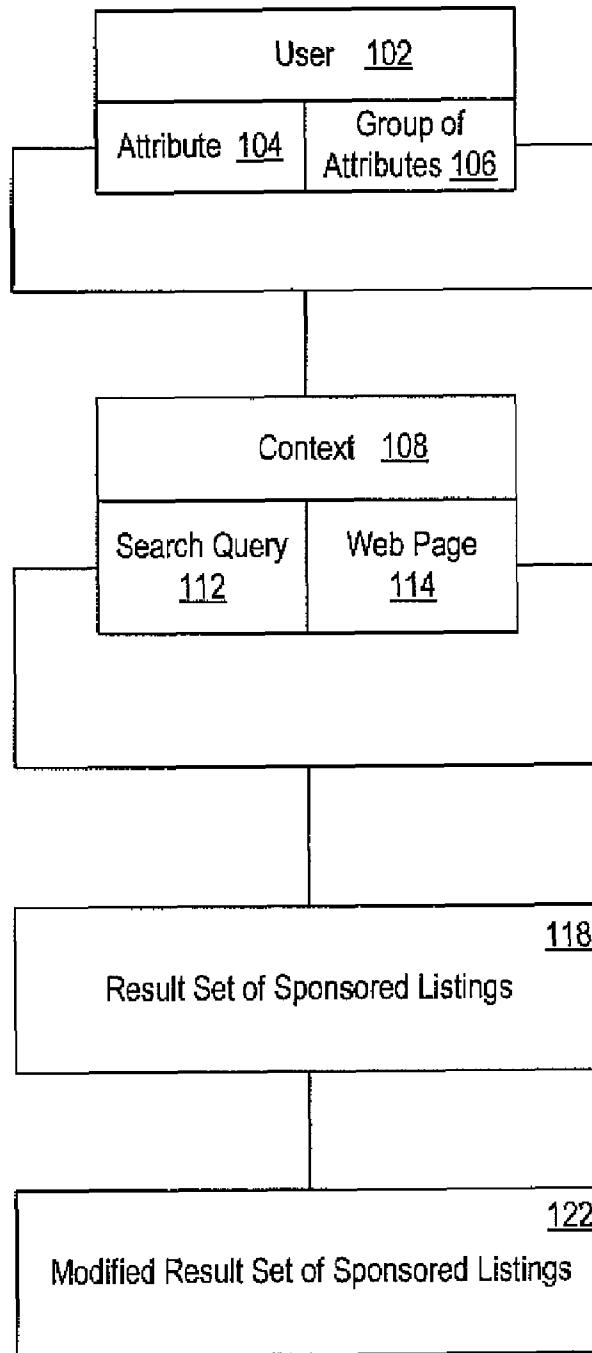


FIG. 1

200

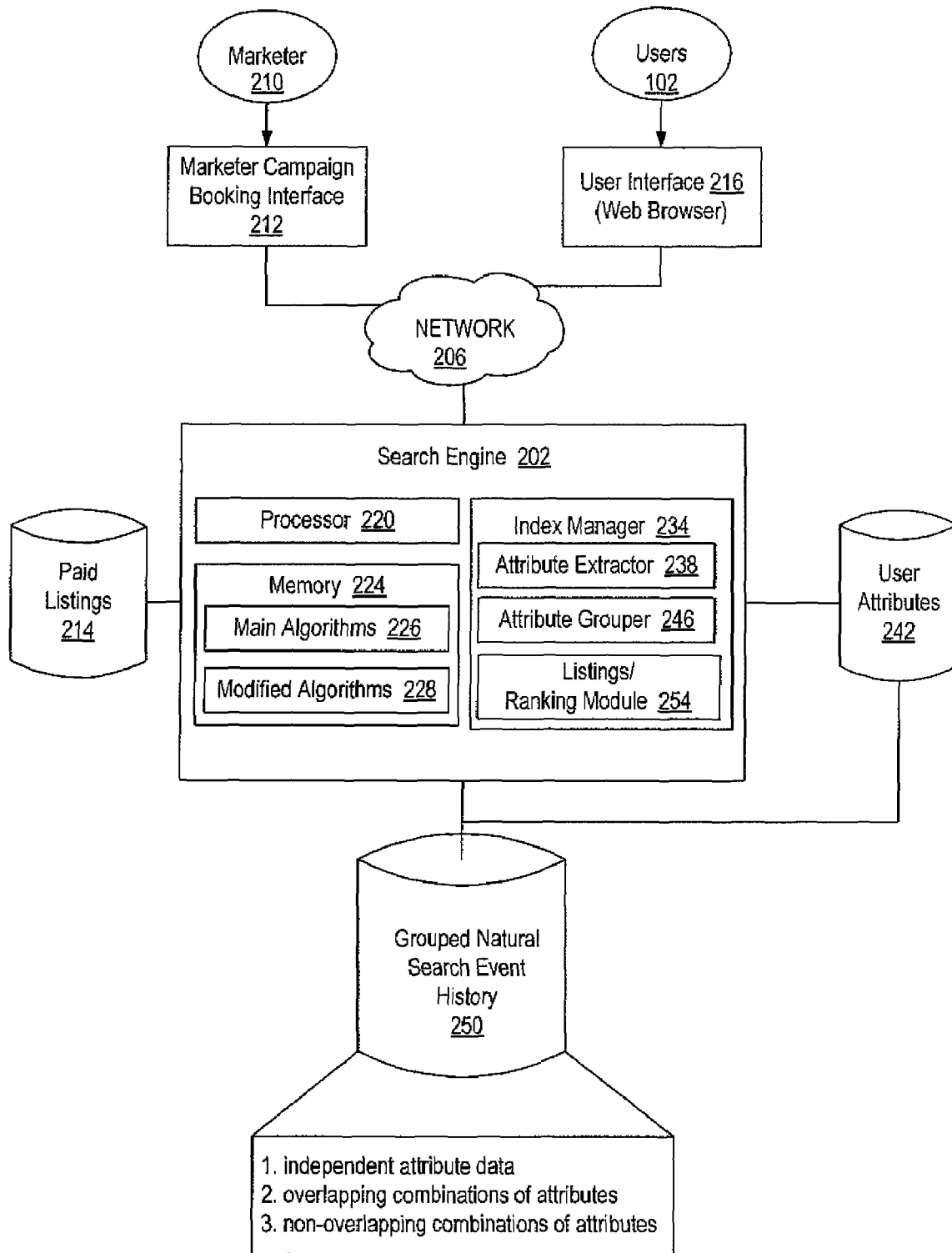


FIG. 2

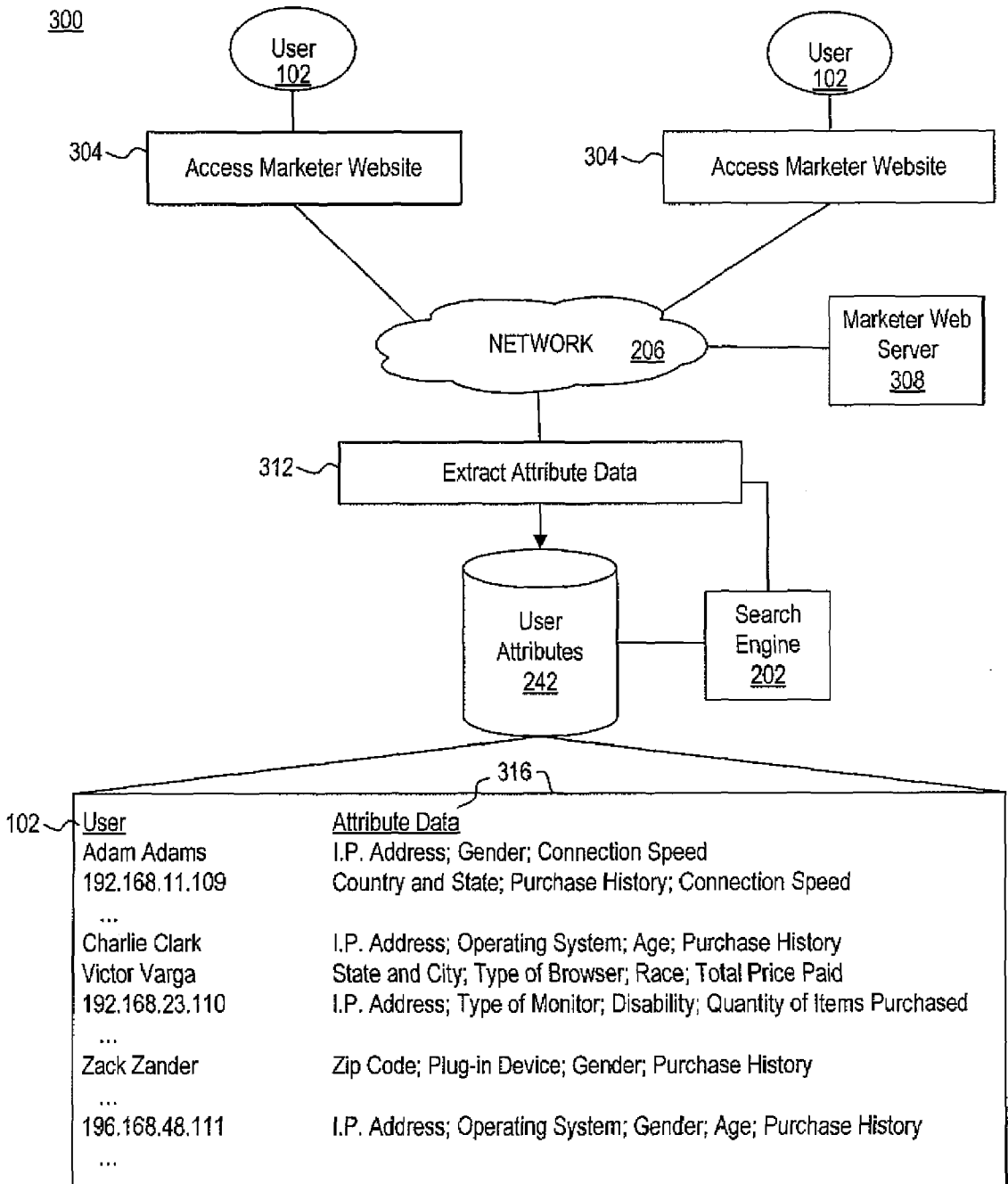


FIG. 3

400

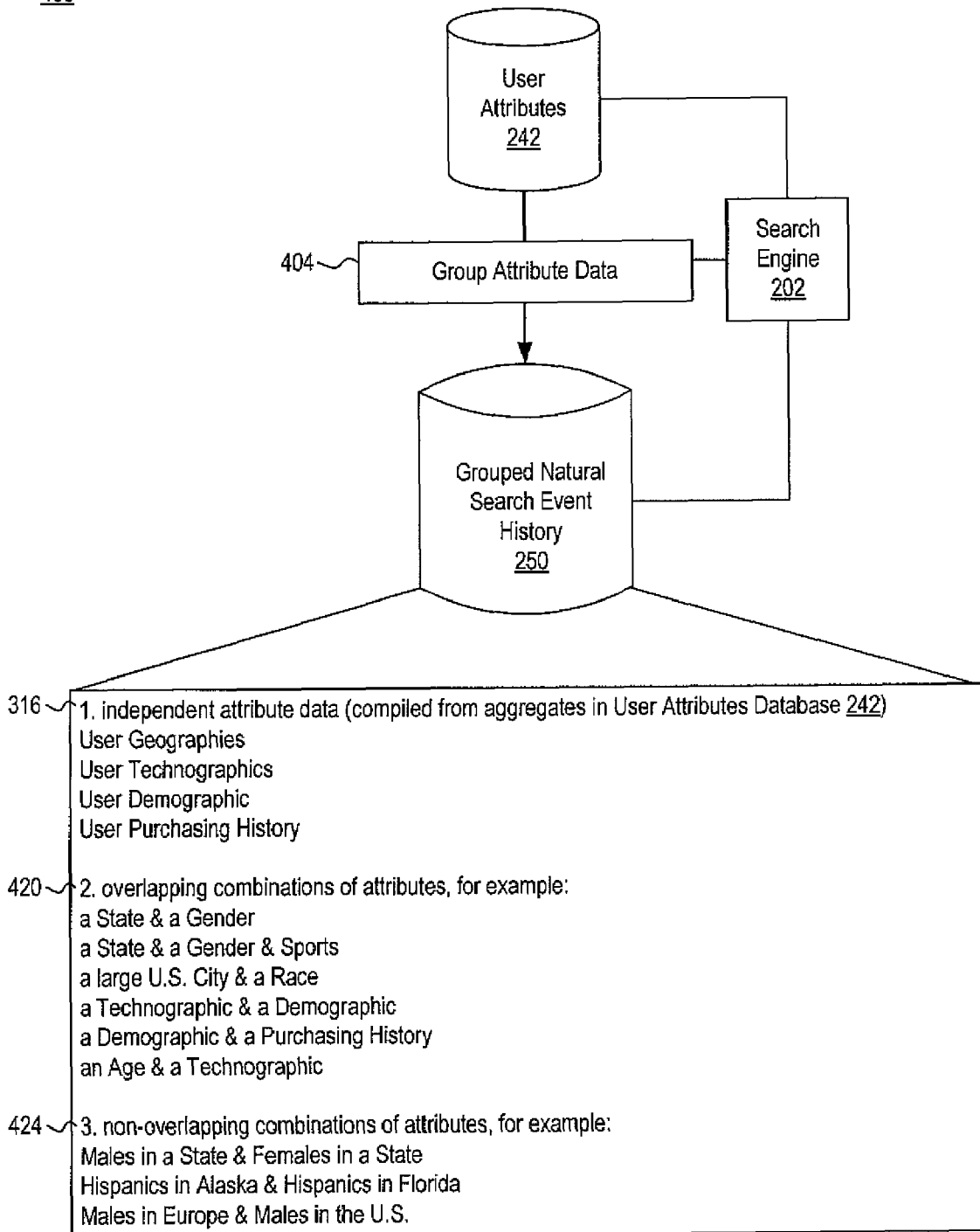


FIG. 4

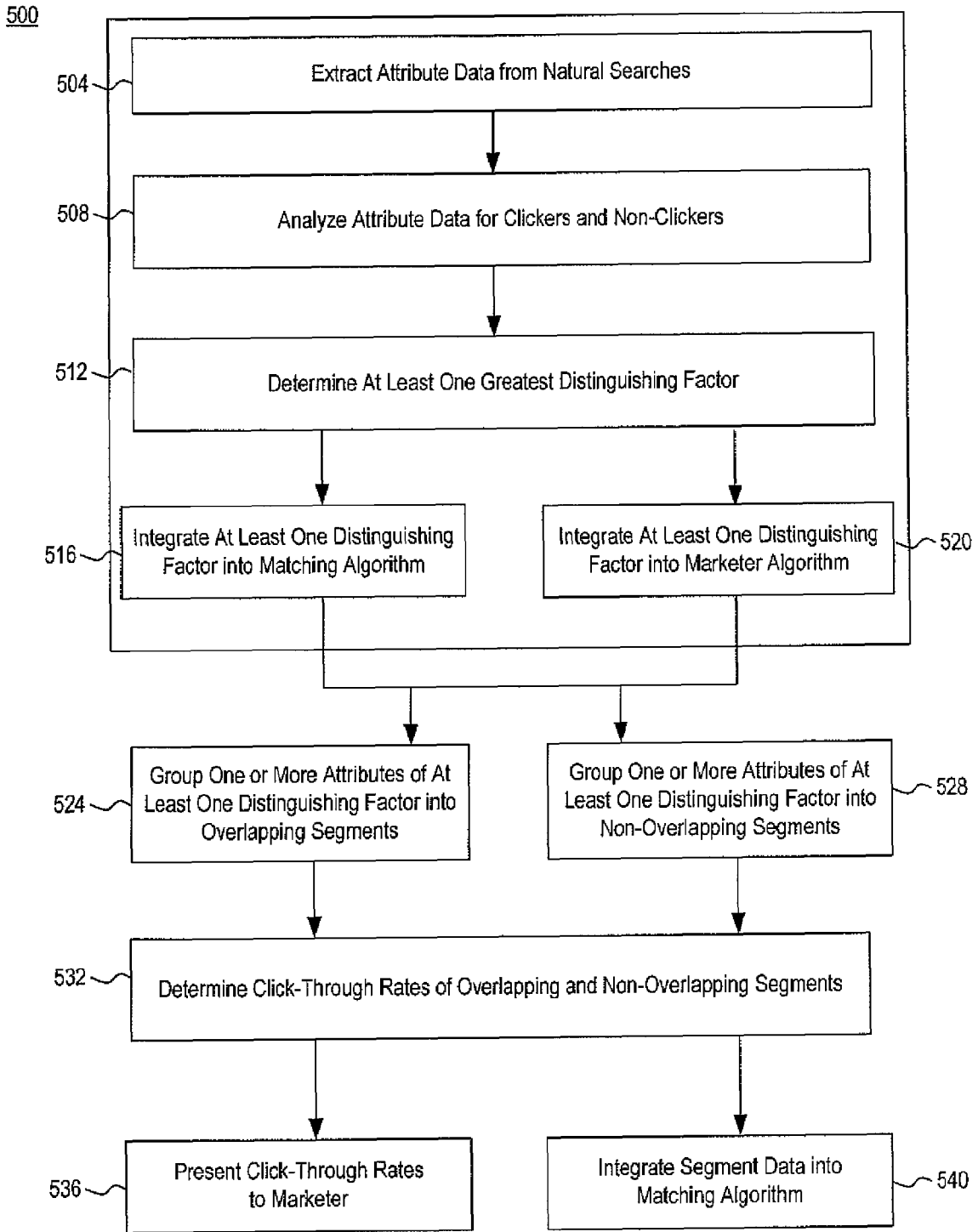


FIG. 5

600

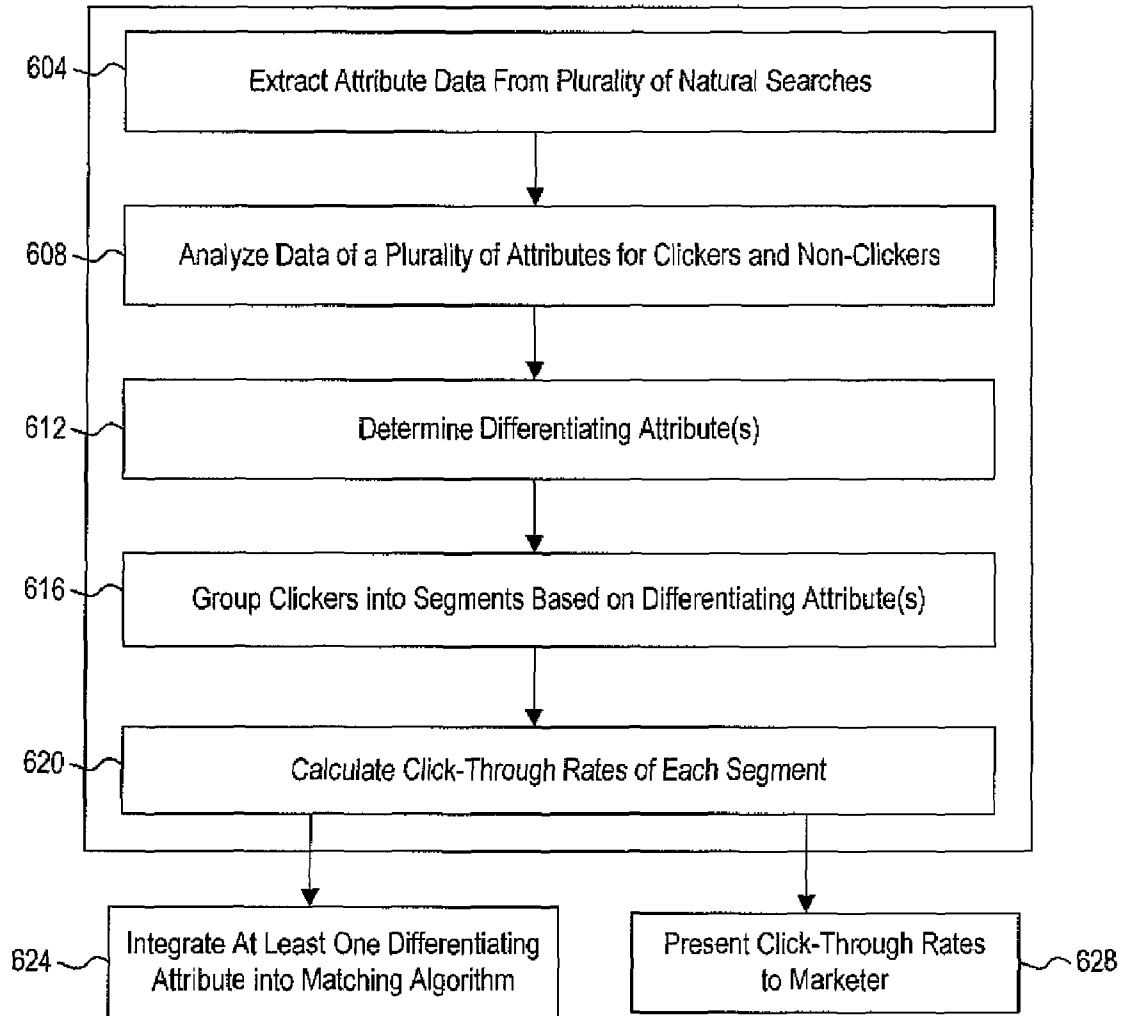


FIG. 6

700

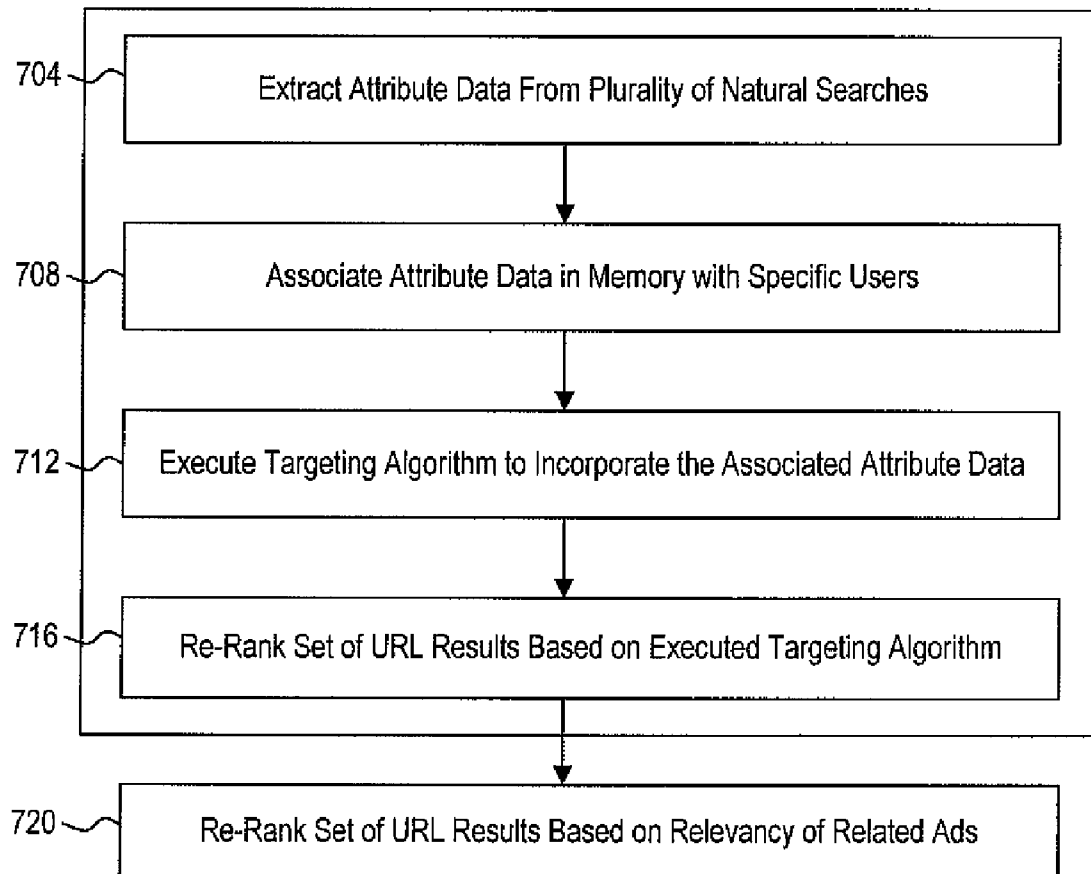


FIG. 7

USING NATURAL SEARCH CLICK EVENTS TO OPTIMIZE ONLINE ADVERTISING CAMPAIGNS

BACKGROUND

1. Technical Field

The disclosed embodiments relate to a system and methods for augmenting, and thus enhancing, sponsored search results in a search engine with natural search click events.

2. Related Art

Pay-per-click sponsored search terms are typically listed at the top of a list of search engine results when users search on such terms. Attached to the search terms are the Uniform Resource Locators (URL) links, which a searcher may click to go to marketers' web pages to further search a given result. The history of those who search for pay-per-click terms is usually well tracked because advertisers or marketers who pay for the terms want to be able to track click-through rates of these terms according to their target markets. This is known as optimizing online campaigns based on past success rates of sponsored search terms.

Click-through rates may be tracked for not only sponsored terms, but also for non-sponsored terms (e.g., unpaid listings), in which the latter creates natural search click events. While clicks on URLs within a set of search results can be directly tracked by a search engine, clicks after a searcher is at a marketer's website may further be tracked by using an invisible pixel tag or "web beacon" on a marketer's web page. A web beacon (also referred to as a web bug) is a piece of software code, which is invisible to a web searcher that pings back to a search engine server to close the loop and report on the extent to which a searcher uses a web page, up to and including purchasing activity. Information gathered may also include who is reading the web page and from what computer. Though many search engine or search term sponsoring companies collect natural search event information, they have done very little with the information in terms of enhancing marketing campaigns or providing searchers with more relevant results. One reason for this outcome is that the information is not directly linked to paid-for search terms. Also, the amount of natural search event information is so voluminous, it is often difficult to process or make sense of the information in a useful, cost-effective way.

SUMMARY

By way of introduction, the embodiments described below include a system and methods for augmenting and enhancing sponsored search results in a search engine with natural search click events.

In a first aspect, a method is disclosed for augmenting sponsored search results in a search engine, which includes extracting attribute data from a plurality of natural searches for a search term linked to a plurality of uniform resource locators (URLs), analyzing the attribute data of one or more attributes for both clickers and non-clickers to determine at least one greatest distinguishing factor between the clickers and non-clickers for the one or more attributes, and integrating the at least one greatest distinguishing factor into a matching algorithm used by the search engine to rank order and display a plurality of the most relevant ads corresponding to the plurality of URLs in response to a search for the term. The method may further include integrating the at least one greatest distinguishing factor into a marketer algorithm used by the search engine to enable a marketer of a URL to strategically

choose a search term, along with the at least one greatest distinguishing factor, on which to bid.

In a second aspect, a method is disclosed for augmenting sponsored search results in a search engine, which includes extracting attribute data from a plurality of natural searches for a search term associated with a plurality of URLs, analyzing the data of a plurality of attributes for both clickers and non-clickers to determine at least one attribute that differentiates clickers from non-clickers, grouping the clickers into segments based on the at least one differentiating attribute, and calculating relative click-through rates of each segment to be associated therewith.

In a third aspect, a method is disclosed for augmenting sponsored search results in a search engine, which includes extracting attribute data from a plurality of natural searches for search terms linked to a plurality of URLs, associating the attribute data in memory with the specific users that conducted the natural searches, executing a targeting algorithm that incorporates the associated attribute data for a user performing a search for a search term, and re-ranking a set of URL results based on the executed targeting algorithm before being displayed to the user.

In a fourth aspect, a system is disclosed for augmenting sponsored search results in a search engine, which includes an index manager to extract attribute data from a plurality of natural searches performed by a search engine for a search term linked to a plurality of URLs. A database is in communication with the index manager to store the extracted attribute data, in which the database comprises user attributes associated in memory with specific users that performed the natural searches and the aggregates of the user attributes grouped by type of attribute. A processor is in communication with the database to perform a method, which includes analyzing the aggregates of the user attributes for both clickers and non-clickers to determine at least one attribute that differentiates clickers from non-clickers, grouping the clickers into one or more segments based on the at least one differentiating attribute, and storing the grouped segments in the database.

A matching algorithm in memory of the search engine may integrate the at least one differentiating attribute to rank order and display the most relevant URL or ad results in response to a search for the term. A marketer algorithm in memory of the search engine may integrate the at least one differentiating attribute to enable a marketer of at least one URL to choose a strategic search term, along with the at least one differentiating attribute, on which to bid. A targeting algorithm in memory of the search engine may integrate the associated attribute data for an identified user performing a search for a search term, wherein when the targeting algorithm is executed, the targeting algorithm re-ranks a set of URL results before being displayed to the identified user. In the various embodiments, attribute data may include user geography, a user technographic, a user demographic, and a user purchasing history, among others.

Other systems, methods, features and advantages will be, or will become, apparent to one with skill in the art upon examination of the following figures and detailed description. It is intended that all such additional systems, methods, features and advantages be included within this description, be within the scope of the disclosure, and be protected by the following claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The system may be better understood with reference to the following drawings and description. The components in the

figures are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the disclosure. Moreover, in the figures, like-referenced numerals designate corresponding parts throughout the different views.

FIG. 1 is a diagram of an exemplary system for augmenting marketing campaigns with natural search events.

FIG. 2 is an exemplary block diagram of a search engine and related storage for implementing the system of FIG. 1 within the larger context of a network such as the Internet.

FIG. 3 is an exemplary block diagram showing one aspect of the search engine of FIG. 2 that is capable of extracting and storing attribute data from natural search events.

FIG. 4 is an exemplary block diagram showing another aspect of the search engine of FIG. 2, which is capable of grouping the extracted attribute data (FIG. 3) into segments by overlapping and by non-overlapping combinations of attribute categories.

FIG. 5 is a flow chart of an exemplary method for augmenting marketing campaigns with natural search events.

FIG. 6 is a flow chart of another exemplary method for augmenting marketing campaigns with natural search events.

FIG. 7 is a flow chart of another exemplary method for augmenting marketing campaigns with natural search events.

DETAILED DESCRIPTION

In the following description, numerous specific details of programming, software modules, user selections, network transactions, database queries, database structures, etc., are provided for a thorough understanding of various embodiments of the systems and methods disclosed herein. However, the system and methods disclosed can be practiced without one or more of the specific details, or can be practiced with other methods, components, materials, etc.

In some cases, well-known structures, materials, or operations are not shown or described in detail. Furthermore, the described features, structures, or characteristics may be combined in any suitable manner in one or more embodiments. The components of the embodiments as generally described and illustrated in the Figures herein could be arranged and designed in a wide variety of different configurations.

The order of the steps or actions of the methods described in connection with the embodiments disclosed may be changed as would be apparent to those skilled in the art. Thus, any order in the Figures or Detailed Description is for illustrative purposes only and is not meant to imply a required order.

Several aspects of the embodiments described are illustrated as software modules or components. As used herein, a software module or component may include any type of computer instruction or computer executable code located within a memory device and/or transmitted as electronic signals over a system bus or wired or wireless network. A software module may, for instance, include one or more physical or logical blocks of computer instructions, which may be organized as a routine, program, object, component, data structure, etc., that performs one or more tasks or implements particular abstract data types.

In certain embodiments, a particular software module may include disparate instructions stored in different locations of a memory device, which together implement the described functionality of the module. Indeed, a module may include a single instruction or many instructions, and may be distributed over several different code segments, among different programs, and across several memory devices. Some embodiments may be practiced in a distributed computing environment where tasks are performed by a remote processing

device linked through a communications network. In a distributed computing environment, software modules may be located in local and/or remote memory storage devices.

FIG. 1 is a diagram of an exemplary system 100 for augmenting marketing campaigns with natural search events. As discussed above, a plurality of users 102 (variably referred to herein as searchers 102) include millions of people throughout the world who use the Internet, or World Wide Web, to browse for information, many of whom also shop online. As users 102 browse, their activity may be tracked through search engine queries and web beacons or the like as discussed above, which activity generates a large volume of natural search event information, in addition to sponsored search term activity. The natural search event information may be broken down into user attributes 104 or group of attributes 106 by categories, such as geography, technographics (the technical specifications of the computer systems used by users 102), demographics, and purchasing history, to name just a few.

Marketers have difficulty determining which targeting attributes 104 to use to achieve any particular marketing goal, especially where they have relied solely on paid-for terms to attract visitors. If they have a given publisher's target market information from the past, marketers can analyze the results of the permutations and then decide which targeting attributes 104 (e.g., location, user attributes 104, context, etc.) worked best for any given advertising content. If they have not used a given targeting attribute 104 of that particular publisher, marketers are unable to predict if the price-premium is worth using that attribute 104. Moreover, focusing solely on the attributes 104 of past campaigns leads to reinforcement of inefficient choices. For example, if a marketer has only targeted males in the past, no analysis would be able to predict the expected performance of targeting females.

The attributes 104 may be gathered in various contexts 108 by conducting search queries 112, by browsing web pages (or websites) 114, or by any other method known in the art for gathering natural search event information of searchers 102. User attributes 104 may be independent or in either overlapping or non-overlapping combinations. When a search query 112 is conducted, the user 102 obtains a result set 118 of marketer listings from a publisher's search engine. The system and methods of the present disclosure may then be used to produce a modified result set 122 of sponsored listings incorporating the natural search event information collected from search queries 112 and browsed web pages 114, etc.

The modified result set 122 will likely include re-ranking the search results listed due to modifications made by a sponsored-listing search engine to a matching algorithm. Other algorithms, such as a targeting algorithm, may also be modified to incorporate natural search information stored and tracked for specific users that may be used to match such users with a modified set of results in which the user would be more likely to be interested. Yet further algorithms, such as a marketer algorithm, may be modified to incorporate general pools of natural search information that can be used to suggest or recommend to marketers various keywords on which to bid, e.g. keywords that best match their target market and/or advertising campaign strategies. Helping marketers on the one hand and modifying result sets 122 on the other allows this disclosure to be implemented into existing technologies in a way that augments marketers' campaign strategies and enhances the relevancy of user results.

FIG. 2 is an exemplary block diagram 200 of a search engine 202 and related storage for implementing the system of FIG. 1 within the larger context of a network 206 such as the Internet. The search engine 200 of system 100 provides

for automatically identifying which attributes **104** an online marketer **210** should use by analyzing the attributes **104** of users **102** engaged in natural search activity, otherwise known as algorithmic search activity. To do this analysis, the attributes **104** are first be extracted (or otherwise collected) and stored as discussed below.

When the marketer **210** accesses the search engine **202** to decide on a marketing campaign, and optionally bid on pay-per-click search terms, it is through a marketer campaign booking interface **212**, which is typically set up as a web page of the publisher. Pay-per-click search terms are associated with relevant Uniform Resource Locators (URLs), or website links, of the marketer's various web pages **114**. Pay-per-click listings are stored in a database **214**, which usually also include ad copy related to the web page **114** to provide relevant, yet enticing or interesting information about the web page **114**. Users **102** access the search engine **202** through a user interface **216** such as a web browser. Clicking on a URL link on a page of search results will take the user **102** to a marketer's web page **114**, and if it is an unpaid listing, will begin to create a history of collectable natural search click events as described above. As will be seen, this history can be collected, stored, and tracked according to individual users, or grouped together and analyzed as a group for various markets or segments defined by one or more attributes.

The search engine **202** includes a processor **202**, a memory **224** containing, inter alia, main algorithms **226** such as matching, targeting, and marketer algorithms **226**, and modified algorithms **228** of each if they exist, and an index manager **234**. The index manager **234** manages the listings of search results, including those sponsored by marketers **210**, and includes an attribute extractor **238** to extract the attributes **104** from natural search activity, such as by communicating with a web beacon of a web page **114** of the marketer **210**. Once attributes **104** are extracted or collected from users **102**, whether for clickers or for non-clickers, they are stored in a user attribute database **242**. The difference between a clicker and a non-clicker is whether a URL or other web page link in a set of search engine results was actually clicked by the user **102** ("a clicker") to drill down to the URL of a marketer **210** listed therein. This initial web page access is also referred to as an "impression," which is used in tracking advertising success metrics such as cost per impression (CPM) and click-through rates. These and other success matrices can be further tracked as the user **102** browses to access further sub-pages of a URL.

The index manager **234** farther includes an attribute grouper **246** to group attributes **104** according to whether combinations of attributes **104** are deemed overlapping or non-overlapping, and some are left in individual attribute **104** categories. Grouped user attributes **106** are then stored in a database **250** of grouped natural search event history. One of skill in the art will appreciate that databases **214**, **242**, and **250** may be a single database, may be distributed across the network **206**, and may optionally be local to the search engine **202**.

The index manager **234** further includes a listings and ranking module **254** to list and rank search results for display to a user **102** searching for a particular keyword search term. The listings include URLs that are linked to the search terms in the paid listings database **214**, which also include ads for the URLs so that the searchers **102** know the general subject matter of the destination web page **114**. The listings and rank module **254** by default uses the main algorithms **226** in memory **224** to produce a ranked list of search results for a search term. Ranked highest in the search results include the highest bidding sponsored ads and/or URLs from the paid

listings database **214**, in addition to the most relevant unpaid listings as determined by the main and modified algorithms **226**, **228**. The main algorithm **226** includes a matching algorithm that bases its relevancy, and thus ranked order, on at least the content of the web page **114** connected to the URL and/or to the associated ad displayed with the search results in a query results page.

Reference to "ads" or URL content as referred to herein may include the relevancy of META tags that are known to be used in search engine optimization, and thus affect the ranking of web pages **114** having different keywords or description therein. Indeed, the META tag description field of a web page will often be used as the ad content displayed in a search engine results page for unpaid websites **114**, e.g. to provide a description of natural search results. Otherwise, META tags are usually invisible to the searcher **102**, but still often used to rank web pages **114**. The main algorithms **226** may also include a targeting algorithm to target any natural search history information acquired, for instance during the current session, to further match the ranking of the listing results to the specific user **102**.

If, however, user attributes exist in the database **242** or stored groups of user attributes exist in the database **250** that relate to the keyword search term, a modified algorithm **228** may be executed by the listings and ranking module **254** to perform URL content and/or ad search term matching. Thus, the search engine **202** may use a modified matching algorithm that incorporates overlapping or non-overlapping grouped attributes from the database **250**, discussed in detail with reference to FIG. 4. And, further, the search engine **202** may use a modified targeting algorithm that incorporates stored history of a specific user **102** doing the searching as found in the user attribute database **242**, discussed in detail with reference to FIG. 3. The targeting algorithm, therefore, seeks to incorporate the specific tastes or preferences of a user **102** as determined by past natural search history of that user **102**.

One of skill in the art will appreciate that main and modified matching and targeting algorithms **226**, **228** may be integrated into respective main and modified matching algorithms **226**, **228**. In addition, there may be only a single algorithm **226** or **228** used that has the option to incorporate various aspects of stored user attributes found in databases **242** and **250** if relevant to a keyword term being search for by a user **102**. One of skill in the art will also appreciate that the processor **220** may be combined with the index manager **234**, and may process portions of software code to implement functions of both.

The processor **220** analyzes the stored one or more attributes **104** for both clickers and non-clickers for a search term to determine at least one factor between the clickers and non-clickers of the searchers **102** for that term that distinguishes them the most. The listings and ranking module **254** may then incorporate this at least one greatest distinguishing factor by use of a modified algorithm **228** to adjust (or re-rank) the order in which the listings are displayed to the searcher **102**. The manner in which a modified algorithm **228** is employed to enhance the relevancy of listings displayed by the listings and rank module **254** based on stored attributes **104** or groups of attributes **106** is discussed in more detail in FIGS. 5 to 7.

Furthermore, the attribute grouper **246** uses the at least one greatest distinguishing factor to come up with segments within the clickers that would be useful to a marketer **210** to augment and enhance an online optimization campaign. Click-through rates or other success metrics may be collected on these various segments to be presented to the marketer **210** or otherwise used in optimizing the marketer's campaign. For

example, success metrics related to grouped segments may help the marketer **210** to make a more informed choice in regards to bidding on search terms to which the segments relate if those segments hold special significance to the target market of the marketer **210**, or may allow the marketer **210** to restrict the scope of coverage of a marketing campaign to specific segments or portions thereof.

FIG. **3** is an exemplary block diagram **300** showing one aspect of the search engine of FIG. **2**, which is capable of extracting and storing attribute data from natural search events created by the users **102**. The users **102** access **304** marketer web pages **114** through marketer web servers **308** over the network **206**, such as the Internet. The search engine **202** connects to the web pages **114** and extracts **312** or otherwise collects **312** attribute data from natural search activity conducted by users **102**, both clickers and non-clickers. As discussed, this may be accomplished by a web beacon that communicates user browser activity and information, together with attribute data **316** composed of attributes **104**, back to the search engine **202** for storage in the user attribute database **242**. The attribute data **316** in the database **242**, as shown, may be stored under a person and/or Internet Protocol (I.P.) address. Common natural search attributes **104** may thus also be collected through cookies and through I.P. address resolution, among other methods.

Examples of attributes **104** thus extracted from searchers **102**, as shown, include geography, such as the country, state, city, and/or zip code where the searcher **102** is browsing from. This type of information is often attainable through resolution of the user's I.P. address. Further examples of attributes **104** include a technographic of a user's system used to access a marketer's web page **114**. Technographics include, for example, connection speed, type of browser, size or quality of a monitor, an operating system, and a plug-in of a connection device (not shown) used by the searcher **102**. This type of information would be indicative of, inter alia, how serious of a computer or online user the searcher **102** is based on how up-to-date or expensive his or her computer system and connection are. Further examples of attributes **104** include demographics, such as age, gender, race, and disability. Attributes **104** may also include a purchasing history of a searcher **102**, which includes such information as a quantity purchased, a price paid per item, and a total price paid, either per visit or over a time period of multiple visits to a web page **114**. As collected in mass, and stored in the database **242**, attributes **104** become attribute data **316**.

FIG. **4** is an exemplary block diagram **400** showing another aspect of the search engine **202**, which is capable of grouping the extracted attributes **104** into segments of attribute categories or types of attributes. For instance, natural search user attributes **104** are collected in the user attribute database **242**, which are then grouped **404** by the attribute grouper **246** of the search engine **202** into segments based on at least one greatest distinguishing factor between the clickers and non-clickers of searchers **102**. These segments of information, along with independent attribute data **316** aggregated from database **242** and categorized into separate types of attributes, are stored in the grouped natural search event history database **250**. As shown, at least two sets of segments are delineated by combinations of attributes that are overlapping **420** and those that are non-overlapping **424**.

Examples of overlapping attributes **420** include all users **102** in a state having a particular gender, as there will always be females and males in all states. Another segment that may be added to the latter includes a sport that users **102** are interested in, despite the fact that some sports attract much more attention from one gender than another. Another

example includes a large United States (U.S.) city and a race because most races are usually represented in large U.S. cities. Because there are so many searchers **102** using the Internet throughout the world, most categories of attribute data **316** will have some overlap with another category.

There are some categories of attribute data **316**, however, that are non-overlapping **424**, and may include all males in California together with all females in California. Another example may include all Hispanics in Alaska together with all Hispanics in Florida, because of the distance and varied geography, creating a very strong mutually exclusive group. Under a similar theory, another non-overlapping segment **424** may include all males in Europe together with all males in the U.S. These are non-exhaustive examples of segments, and many more may be thought of or created for the purposes of enhancing online marketing campaigns for marketers **210**. The segments may be tracked in terms of click-through rates (or other success metrics) affiliated therewith.

FIG. **5** is a flow chart **500** of an exemplary method for augmenting marketing campaigns with natural search events. First, attribute data **316** may be extracted at **504** by the search engine **202** from a plurality of natural searches for a search term that is linked to a plurality of URLs. A search engine **202** analyzes, at step **508**, the attribute data **316** of both clickers and non-clickers. The search engine **202** then determines, at step **512**, at least one greatest distinguishing factor between the clickers and the non-clickers. The at least one greatest distinguishing factor is then integrated, at step **516**, into a matching algorithm **228** used by the search engine **202** to rank order and display a plurality of the most relevant ads corresponding to the plurality of URLs in response to a search for the term. Furthermore, the at least one distinguishing factor may be integrated, at step **520**, into a marketer algorithm **228** used by the search engine **202** to enable a marketer **210** of at least one URL to strategically choose the search term, along with the at least one greatest distinguishing factor, on which to bid. In addition, the URLs themselves may be used in being ranked according to relevancy the content of the web pages **114** linked from the URLs.

In addition to the above integration steps at steps **516** and **520**, the search engine **202** may group, at step **524**, the one or more attributes **104** having at least one greatest distinguishing factor to identify one or more overlapping segments **420** of clickers. Likewise, the search engine **202** may group, at step **528**, the one or more attributes **104** of the at least one distinguishing factor into non-overlapping **424** segments of clickers. The search engine **202** may then determine, at step **532**, the click-through rates (or other success metrics) of overlapping and non-overlapping segments **420**, **424**. Finally, the search engine **202** may present the click-through rates, at step **536**, to a marketer **210** to help the marketer **210** to optimize an online campaign as discussed. The search engine **202** may also integrate segment data from steps **524** and **528** into the matching algorithm **228** to help automatically match relevant ads to a specific searching user **102** based on the at least one distinguishing factors. The later is possible because the search engine **202** is in communication with the user attributes database **242** in which specific attributes remain associated with specific users **102**, and which may be mapped to strongly associated segments from steps **524** to **532**.

FIG. **6** is a flow chart **600** of another exemplary method for augmenting marketing campaigns with natural search events. At step **604**, a search engine **202** extracts or otherwise collects attribute data **316** from a plurality of natural searches for a search term associated with a plurality of URLs. The search engine **202** then analyzes, at step **608**, the data **316** of a plurality of attributes **104** for both clickers and non-clickers.

At step 612, the search engine 202 determines at least one differentiating attribute as between the clickers and the non-clickers. At step 616, the search engine 202 then groups the clickers into segments based on the at least one differentiating attribute. The search engine 202 calculates click-through rates of each segment to be associated therewith. Additionally, the search engine 202 may integrate, at step 624, the at least one differentiating attribute into a matching algorithm 228 used by the search engine 202 to order rank and display at least one of the most relevant URL results and the most relevant ads corresponding to the plurality of URLs in response to a search for the term. Finally, at step 628, the click-through rates may be presented to a marketer 210 to improve campaign optimization when the marketer 210 decides whether to bid on a term having included therewith a related segment.

FIG. 7 is a flow chart 700 of an exemplary method for augmenting marketing campaigns with natural search events. First, attribute data may be extracted at 704 by the search engine 202 from a plurality of natural searches for a search term that is linked to a plurality of URLs. A search engine 202 associates, at step 708, the attribute data in memory (such as in user attributes database 242) with specific users 102 that conducted the natural searches. The search engine 202 executes, at step 712, a targeting algorithm 228 that incorporates the associated attribute data for a user 102 performing a search for a search term. And, at step 716, the search engine 202 re-ranks a set of URL results based on the executed targeting algorithm 228 before being displayed to the user 102. The search engine may also, at step 720, re-rank the set of URL results based on the relevancy of a plurality of ads corresponding to the URLs as determined by the targeting algorithm. Note, as indicated before, that the targeting and matching algorithms may be combined into a single algorithm, so that although FIGS. 5 and 6 mention matching algorithms and FIG. 7 mentions a targeting algorithm does not mean that the two algorithms are mutually exclusive.

While specific embodiments and applications of various methods and systems for conducting experiments over the Internet have been illustrated and described, it is to be understood that the disclosure claimed hereinafter is not limited to the precise configuration and components disclosed. Various modifications, changes, and variations apparent to those of skill in the art may be made in the arrangement, operation, and details of the methods and systems disclosed.

The embodiments may include various steps, which may be embodied in machine-executable instructions to be executed by a general-purpose or special-purpose computer (or other electronic device). Alternatively, the steps may be performed by hardware components that contain specific logic for performing the steps, or by any combination of hardware, software, and/or firmware.

Embodiments may also be provided as a computer program product including a machine-readable medium having stored thereon instructions that may be used to program a computer (or other electronic device) to perform processes described herein. The machine-readable medium may include, but is not limited to, floppy diskettes, optical disks, CD-ROMs, DVD-ROMs, ROMs, RAMs, EPROMs, EEPROMs, magnetic or optical cards, propagation media or other type of media/machine-readable medium suitable for storing electronic instructions. For example, instructions for performing described processes may be transferred from a remote computer (e.g., a server) to a requesting computer (e.g., a client) by way of data signals embodied in a carrier wave or other propagation medium via a communication link (e.g., network connection).

What is claimed is:

1. A computer-implemented method for augmenting sponsored search results in a search engine having a processor and storage, the method comprising:

extracting user attribute data by the search engine from a plurality of natural searches executed previously by a plurality of users for a search term that is linked to a plurality of uniform resource locators (URLs);

analyzing, by the search engine, the attribute data of one or more attributes for both clickers and non-clickers to determine at least one greatly distinguishing factor between the clickers and non-clickers for the one or more attributes;

grouping, by the search engine, the one or more attributes having at least a greatest distinguishing factor to identify one or more non-overlapping segments of clickers; and in response to a search by a searching user for the term, integrating, by the search engine, the at least one greatest distinguishing factor into a matching algorithm to rank, order, and display a plurality of the most relevant ads corresponding to the plurality of URLs based on the aggregate of non-overlapping segments, wherein the plurality of most relevant ads have the highest aggregate of non-overlapping segment data matching the searching user.

2. The method of claim 1, further comprising:

integrating the at least one greatest distinguishing factor into a marketer algorithm used by the search engine to enable a marketer of a URL to strategically choose a search term, along with the at least one greatest distinguishing factor, on which to bid.

3. The method of claim 1, wherein the one or more attributes comprise user geography.

4. The method of claim 3, wherein the at least one greatest distinguishing factor comprises one or more selected from the group consisting of country, state, city, and zip code.

5. The method of claim 3, wherein the user geography is determined from internet Protocol (I.P.) addresses of users executing the natural searches.

6. The method of claim 1, wherein the one or more attributes comprise a user technographic, and the at least one greatest distinguishing factor comprises one or more selected from the group consisting of a connection speed, a type of browser, a size or quality of monitor, an operating system, and a plug-in of a connection device used by the user.

7. The method of claim 1, wherein the one or more attributes comprise a user demographic, and the at least one greatest distinguishing factor comprises one or more selected from the group consisting of age, gender, race, and disability.

8. The method of claim 1, wherein the one or more attributes comprise an aspect of user purchasing history, and the aspect of user purchasing history comprises one or more selected from the group consisting of a quantity purchased, a price paid per item, and a total price paid.

9. The method of claim 1, further comprising:

integrating the at least one greatest distinguishing factor into a marketer algorithm used by the search engine to suggest the search term to a marketer of a URL, along with the at least one greatest distinguishing factor, on which to bid.

10. A computer-implemented method for augmenting sponsored search results in a search engine having a processor and storage, the method comprising:

extracting user attribute data by the search engine from a plurality of natural searches executed previously by a plurality of users for a search term that is associated with a plurality of uniform resource locators (URLs);

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analyzing, by the search engine, the data of a plurality of attributes for both clickers and non-clickers to determine at least one attribute that greatly differentiates clickers from non-clickers;

grouping, by the search engine, the clickers into different segments based at least on a greatest differentiating attribute;

identifying, by the search engine, one or more overlapping segments and non-overlapping segments;

calculating, by the search engine, relative click-through rates of each respective group based on the identified one or more overlapping and non-overlapping segments; and

presenting, by the search engine, a bidding interface that displays an optimum set of relative click-through rate results for each respective group based on the aggregate of one or more overlapping and non-overlapping segments.

11. The method of claim 10, further comprising:

integrating the at least one differentiating attribute into a matching algorithm used by the search engine to rank order and display at least one of the most relevant URL results and the most relevant ads corresponding to the plurality of URLs in response to a search for the term.

12. The method of claim 11, wherein the at least one differentiating attribute comprises one or more selected from the group consisting of a user geography, a user technographic, a user demographic, and a user purchasing history.

13. A computer-implemented method for augmenting sponsored search results in a search engine having a processor and storage, the method comprising:

extracting user attribute data, by the search engine, from a plurality of natural searches executed previously by a plurality of users for search terms that are linked to a plurality of uniform resource locators (URLs) and from web pages browsed by the plurality of users;

associating, by the search engine, the attribute data in memory with the specific users that conducted the natural searches and performed the web page browsing;

analyzing, by the search engine, the attribute data of one or more attributes for both clickers and non-clickers to determine at least one greatest distinguishing factor between the clickers and non-clickers for the one or more attributes;

grouping, by the search engine, the one or more attributes having the at least one greatest distinguishing factor to identify one or more overlapping segments of clickers;

integrating, by the search engine, the one or more overlapping segments of clickers into a matching algorithm used by the search engine to rank, order, and display a plurality of the most relevant ads corresponding to the plurality of URLs in response to a search for the search term;

executing, by the search engine, a targeting algorithm that incorporates the associated attribute data for each specific user that performed a search for a search term; and re-ranking, by the search engine, a set of URL results based on the executed targeting algorithm and matching algorithm before displaying the results.

14. The method of claim 13, wherein the matching algorithm includes the targeting algorithm.

15. The method of claim 13, wherein the attribute data comprises one or more selected from the group consisting of a user geography, a user technographic, a user demographic, and a user purchasing history.

16. A computer-implemented system for augmenting sponsored search results in a search engine, the system comprising:

an index manager to extract user attribute data from a plurality of natural searches performed previously by a

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search engine on behalf of users for a search term that is linked to a plurality of uniform resource locators (URLs);

a database, in communication with the index manager, to store the extracted attribute data, wherein the database comprises user attributes associated in memory with specific users that performed the natural searches and aggregates of the user attributes grouped by type of attribute, wherein the database is stored in memory storage coupled with the search engine; and

a processor in communication with the database to:

analyze the user attributes for both clickers and non-clickers to determine at least one attribute that greatly differentiates clickers from non-clickers;

group the clickers into one or more overlapping segments based at least on a greatest differentiating attribute;

store the groups of clickers and overlapping segments in the database; determine the relative click-through rates of the one of more groups of clickers based on the one or more overlapping segments; and

match a relevant ad or URL to a search user by aggregating the user attributes of the one or more overlapping segments.

17. The system of claim 16, wherein the memory storage includes a matching algorithm, wherein the processor integrates the at least one differentiating attribute into the matching algorithm used by the search engine to rank order and display the most relevant URL or ad results in response to a search for the term.

18. The system of claim 16, wherein the memory storage includes a marketer algorithm, wherein the processor integrates the at least one differentiating attribute into the marketer algorithm to enable a marketer of at least one URL to choose a strategic search term, along with the at least one differentiating attribute, on which to bid.

19. The system of claim 16, wherein the memory storage includes a targeting algorithm, wherein the processor:

executes the targeting algorithm that incorporates the associated attribute data for an identified user performing a search for a search term; and

re-ranks a set of URL results based on the executed targeting algorithm before being displayed to the identified user.

20. The system of claim 16, wherein the attribute types comprise user geography, and the at least one differentiating attribute comprises one or more selected from the group consisting of country, state, city, zip code, and Internet Protocol (I.P.) address.

21. The system of claim 16, wherein the attribute types comprise a user demographic, and wherein the at least one differentiating attribute comprises one or more selected from the group consisting of age, gender, race, and disability.

22. The system of claim 16, wherein the attribute types comprise an aspect of user purchasing history, which comprises one or more selected from the group consisting of a quantity of items purchased, a price paid per item, and a total price paid.

23. The system of claim 16, wherein the attribute types comprise a user technographic, and wherein the at least one differentiating attribute comprises one or more selected from the group consisting of a connection speed, a type of browser, a size or quality of monitor, an operating system, and a plug-in of a connection device used by the user.

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

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Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Claims

In column 10, claim 6, line 43, before “the group consisting of” replace “form” with --from--.

In column 11, claim 12, line 24, after “or more selected” replace “form” with --from--.

In column 11, claim 15, line 60, after “one or more selected” replace “form” with --from--.

In column 12, claim 20, line 47, after “one or more selected” replace “form” with --from--.

In column 12, claim 21, line 52, after “one or more selected” replace “form” with --from--.

In column 12, claim 22, line 56, before “the group consisting of” replace “form” with --from--.

Signed and Sealed this
Eighteenth Day of June, 2013



Teresa Stanek Rea
Acting Director of the United States Patent and Trademark Office