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(54) **IMPLEMENTATION OF A SEARCH FOR ITEMS**

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(52) **U.S. Cl.**
USPC **707/767**; 707/768

(58) **Field of Classification Search**
USPC 707/767, 768
See application file for complete search history.

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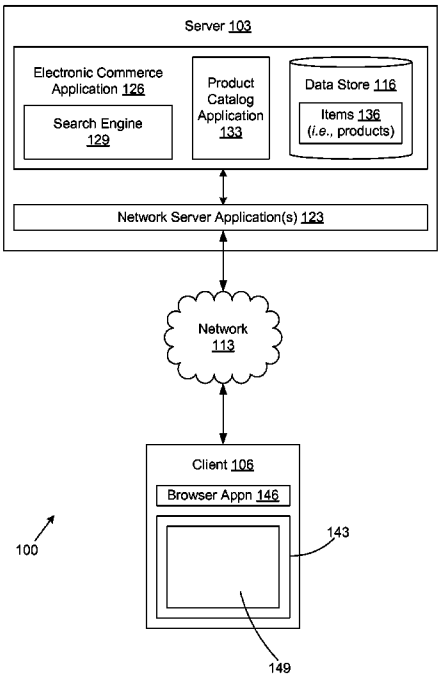
(57) **ABSTRACT**

Disclosed are various embodiments for generating search results when a search string fails to return results as entered. In a representative example, a failure of a first query generated from a search string to identify at least a predefined threshold number of items from among a plurality of items in a data store is detected in a computing device. A plurality of altered versions of the search string is generated in the computing device. A submission of a plurality of second queries to the data store is implemented, where each of the second queries corresponds to one of the altered versions of the search string. A presentation is generated to be rendered of at least two separate groups of items resulting from corresponding ones of the second queries.

25 Claims, 4 Drawing Sheets



Google Exhibit 1006
Google v. AccuSearch

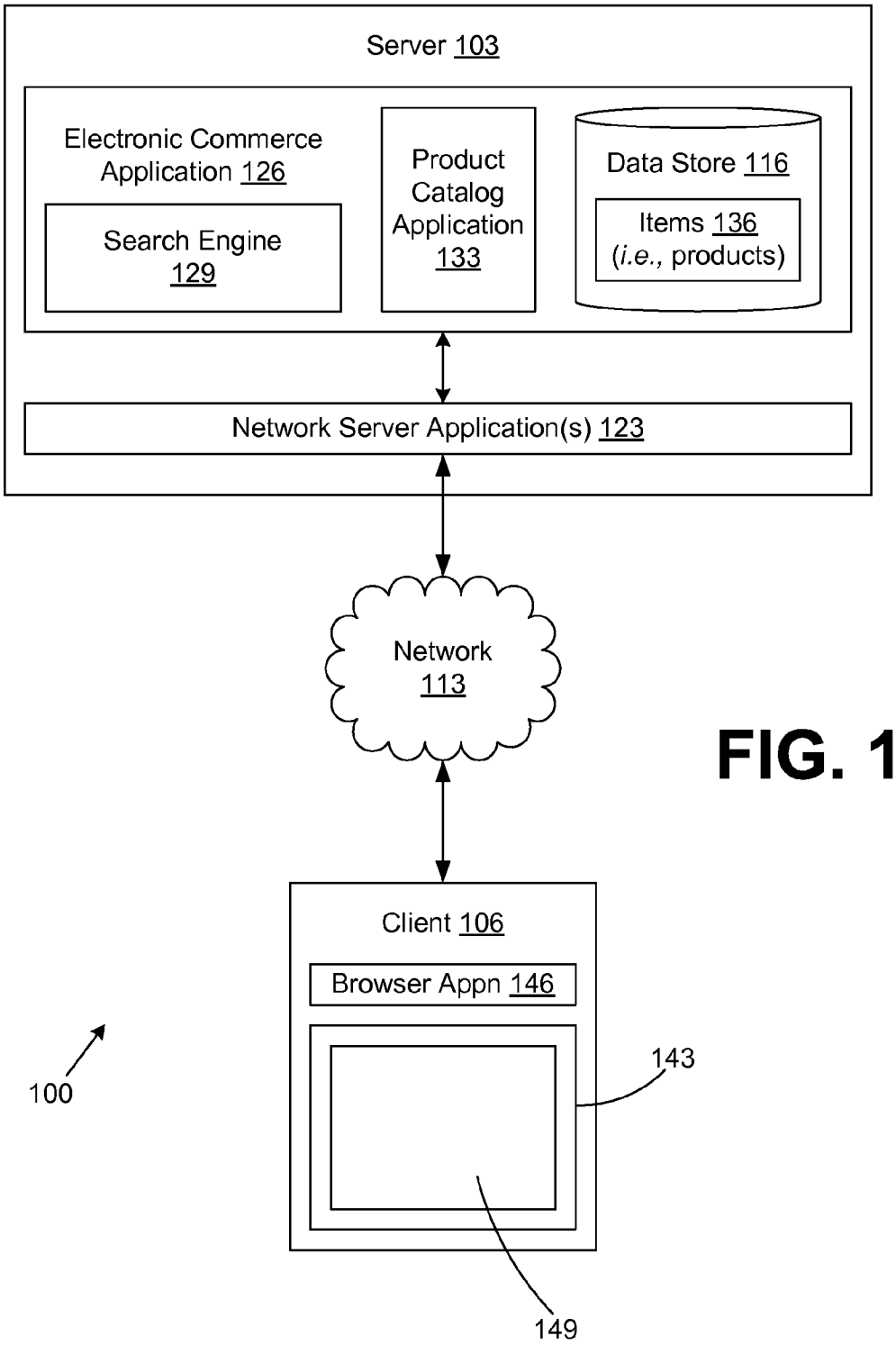

Server 103
Electronic Commerce Application 126
Search Engine 129
Product Catalog Application 133
Data Store 116
Items 136 (i.e., products)
Network Server Application(s) 123
Network 113
Client 106
Browser Appn 146
100
143
149

FIG. 1

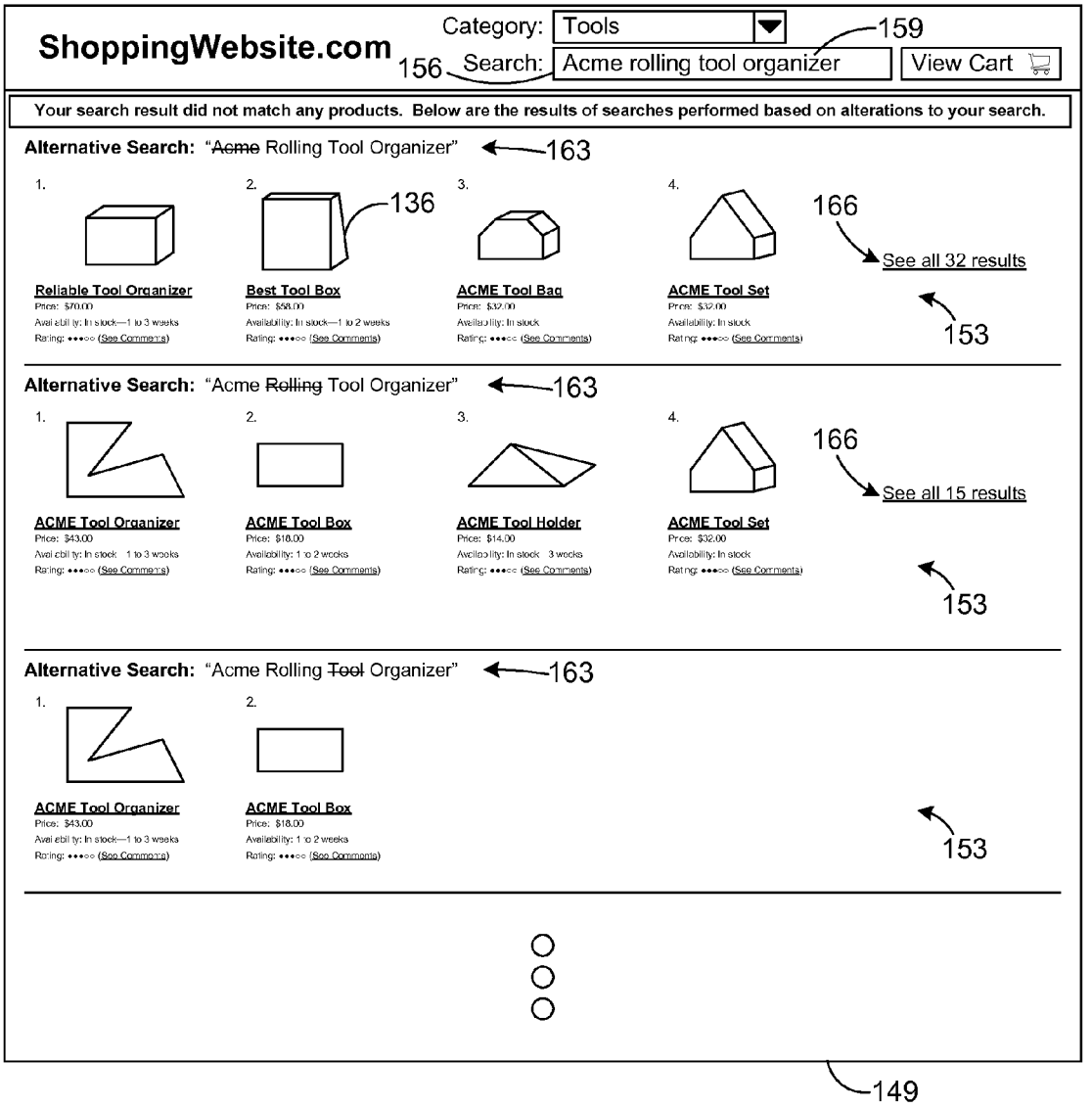

ShoppingWebsite.com
Category: Tools
Search: Acme rolling tool organizer
View Cart
159
156
Your search result did not match any products. Below are the results of searches performed based on alterations to your search.
Alternative Search: "~~Acme~~ Rolling Tool Organizer"
163
1.
2.
3.
4.
136
166
See all 32 results
Reliable Tool Organizer
Price: $70.00
Availability: In stock—1 to 3 weeks
Rating: ●●●○○ (See Comments)
Best Tool Box
Price: $58.00
Availability: In stock—1 to 2 weeks
Rating: ●●●○○ (See Comments)
ACME Tool Bag
Price: $32.00
Availability: In stock
Rating: ●●●○○ (See Comments)
ACME Tool Set
Price: $32.00
Availability: In stock
Rating: ●●●○○ (See Comments)
153
Alternative Search: "Acme ~~Rolling~~ Tool Organizer"
163
1.
2.
3.
4.
166
See all 15 results
ACME Tool Organizer
Price: $43.00
Availability: In stock 1 to 3 weeks
Rating: ●●●○○ (See Comments)
ACME Tool Box
Price: $18.00
Availability: 1 to 2 weeks
Rating: ●●●○○ (See Comments)
ACME Tool Holder
Price: $14.00
Availability: In stock 3 weeks
Rating: ●●●○○ (See Comments)
ACME Tool Set
Price: $32.00
Availability: In stock
Rating: ●●●○○ (See Comments)
153
Alternative Search: "Acme Rolling ~~Tool~~ Organizer"
163
1.
2.
ACME Tool Organizer
Price: $43.00
Availability: In stock—1 to 3 weeks
Rating: ●●●○○ (See Comments)
ACME Tool Box
Price: $18.00
Availability: 1 to 2 weeks
Rating: ●●●○○ (See Comments)
153
149

FIG. 2

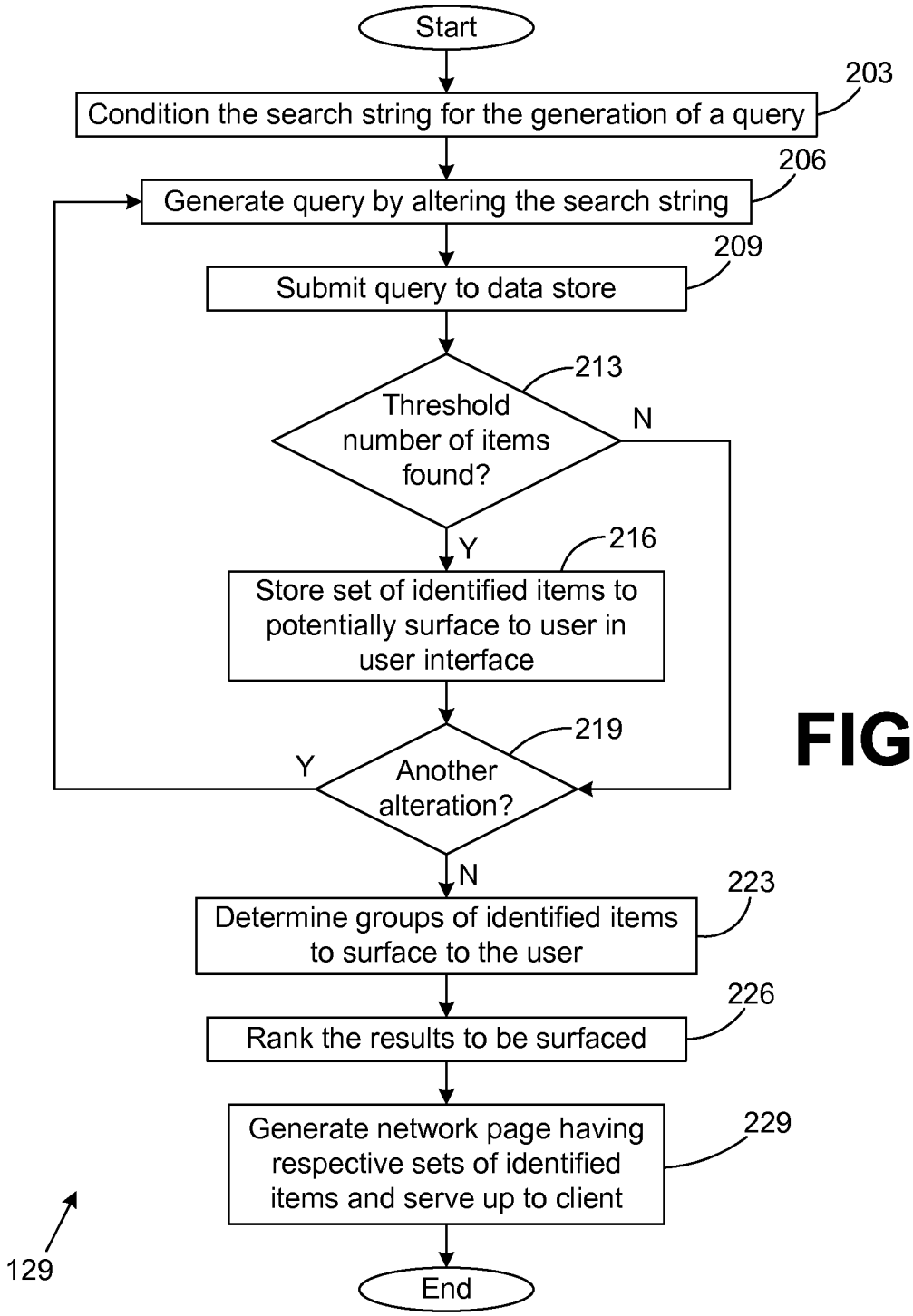

Start
Condition the search string for the generation of a query
203
Generate query by altering the search string
206
Submit query to data store
209
Threshold number of items found?
213
N
Y
Store set of identified items to potentially surface to user in user interface
216
Another alteration?
219
Y
N
Determine groups of identified items to surface to the user
223
Rank the results to be surfaced
226
Generate network page having respective sets of identified items and serve up to client
229
End
129

FIG. 3

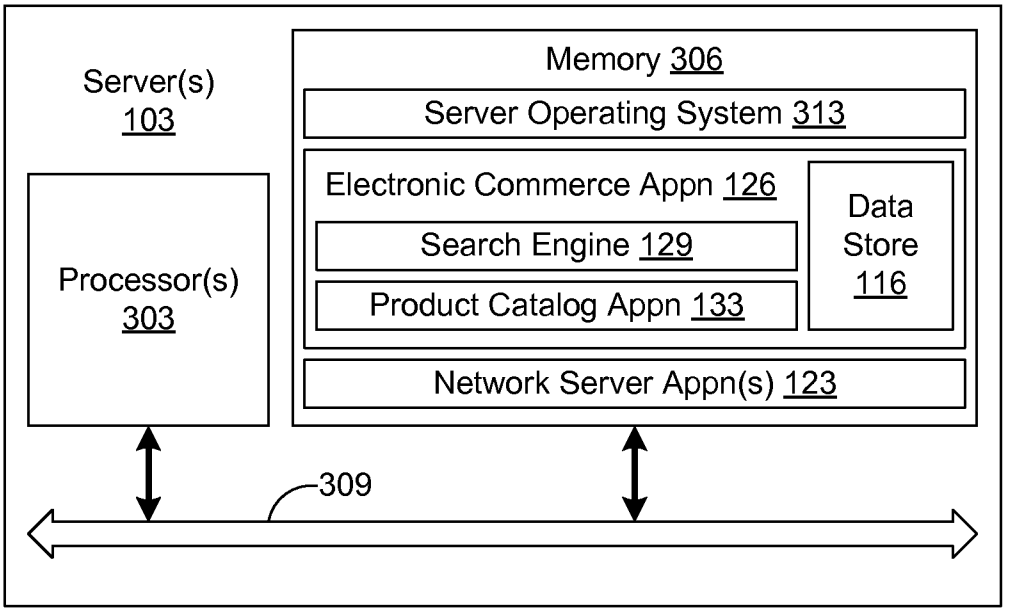

Server(s)
103
Processor(s)
303
Memory 306
Server Operating System 313
Electronic Commerce Appn 126
Search Engine 129
Product Catalog Appn 133
Data
Store
116
Network Server Appn(s) 123
309

FIG. 4

IMPLEMENTATION OF A SEARCH FOR ITEMS

BACKGROUND

Merchant websites may provide customers with the ability to identify a product to purchase by using a word search. Unfortunately, it can happen that a customer may enter a word search that has too many terms. In such cases, a merchant website may indicate that no products match the search due to the fact that the search was overly constrained.

BRIEF DESCRIPTION OF THE DRAWINGS

Many aspects of the present disclosure can be better understood with reference to the following drawings. The components in the drawings are not necessarily to scale, emphasis instead being placed upon clearly illustrating the principles of the disclosure. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

FIG. **1** is a drawing of one example of a data communications network according to an embodiment of the present disclosure.

FIG. **2** is a drawing of one example of a user interface generated by a device in the data communications network of FIG. **1** according to an embodiment of the present disclosure.

FIG. **3** is a flowchart that provides one example of functionality implemented in a computing device in the data communications network of FIG. **1** according to an embodiment of the present disclosure.

FIG. **4** is a schematic block diagram that illustrates one example of a computing device employed in the data communications network of FIG. **1** according to an embodiment of the present disclosure.

DETAILED DESCRIPTION

The following discussion describes systems and methods relating to the enhancement of word searching using a search string in the context of an online marketplace or any other search context according to various embodiments. In one embodiment, a customer may enter a search string in order to search for one or more products sold through the network presence of online merchants. For the sake of convenience, first a data communications network **100** is described, followed by a discussion of the operation of the various components of the data communications network **100** according to various embodiments.

With reference to FIG. **1**, shown is an example of a data communications network **100** that includes various computing devices such as one or more servers **103** and one or more clients **106** that are coupled to a network **113**. The network **113** may comprise, for example, the Internet, intranets, extranets, wide area networks (WANs), local area networks (LANs), wired networks, wireless networks, or other suitable networks, etc., or any combination of two or more such networks. For purposes of convenience, the one or more servers **103** and the one or more clients **106** are referred to herein in the singular. However, it is understood that in one embodiment, the server **103** may represent a plurality of servers, and the client **106** may represent a plurality of clients.

The server **103** comprises one example of a computing device that may be employed to execute various components as described herein. The server **103** may comprise, for example, a server computer or like system. The server **103** may represent multiple servers arranged, for example, in one or more server banks or other arrangements. Such servers **103** may be located in a single installation or may be dispersed among many different geographical locations. To this end, the server **103** may be viewed as a server "cloud" that represents the computing capacity of multiple servers, etc.

Various applications and/or engines are executed in the server **103** according to various embodiments. Also, various data may be stored in a data store **116** that is accessible to the server **103**. The data stored in the data store **116** may be associated with the operation of the various applications and/or engines described below. The applications executed on the server **103** include a network server application **123**, an electronic commerce application **126**, and potentially other applications.

The network server application **123** may comprise, for example, web servers or other types of network server applications **123** that provide browser access or other appropriate types of access to content and applications in the server **103** to clients **106** and the like using various protocols such as the transmission control protocol/Internet Protocol (TCP/IP). To this end, the network server application **123** may comprise multiple component applications as can be appreciated.

The electronic commerce application **126** facilitates the network presence of one or more online merchants. To this end, the electronic commerce application **126** may comprise one or more component applications and/or engines. Such components may comprise, for example, a search engine **129**, a product catalog application **133**, and other components. Such components may be implemented on a plurality of servers **103** that are located at one site, or are distributed among geographically diverse sites as can be appreciated. The search engine **129** is configured to submit queries to the product catalog application **133**. The product catalog application **133** is configured to search items **136** in the data store **116** based upon a query. Such items **136** may comprise, for example, products such as goods and/or services or other items. The data store **116** may be centrally located or the data store **116** may be distributed among multiple sites as can be appreciated.

It should be understood that searches performed to identify desired items **136** such as products for purchase provides one example environment of the present disclosure and that searches may be performed on other subject matter using the various principles described herein.

The client **106** is representative of a plurality of client devices that may be coupled to the network **113**. For example, the client **106** may comprise one of millions of clients **106** coupled to the Internet. The client **106** may comprise, for example, a processor-based system such as a computer system. Such a computer system may be embodied in the form of a desktop computer, a laptop computer, a personal digital assistant, a cellular telephone, set-top box, music players, web pads, tablet computer systems, or other devices with like capability.

The client **106** may include, for example various peripheral devices. In particular, the peripheral devices may include input devices such as, for example, a keyboard, keypad, touch pad, touch screen, microphone, scanner, mouse, joystick, or one or more push buttons, etc. The peripheral devices may also include a display device **143**, indicator lights, speakers, etc. The display device **143** may comprise, for example, cathode ray tubes (CRTs), liquid crystal display (LCD) screens, gas plasma-based flat panel displays, LCD projectors, or other types of display devices, etc.

Executed within the client **106** are various applications including a browser application **146**. The client browser application **146** is configured to interact with the electronic

commerce applications **126** and potentially other applications on the server **103** through the network server application **123** according to an appropriate protocol such as the Internet Protocol Suite comprising Transmission Control Protocol/Internet Protocol (TCP/IP) or other protocols. To this end, the browser application **146** may comprise, for example, a commercially available browser such as INTERNET EXPLORER® sold by Microsoft Corporation of Redmond, Wash., or MOZILLA FIREFOX® which is promulgated by Mozilla Corporation of Mountain View, Calif., or other type of browser. Alternatively, the browser application **146** may comprise some other application with like capability. When executed in the client **106**, the browser application **146** renders network pages **149** or other types of user interfaces on the display device **143** or other rendering device. In one embodiment, the network page **149** comprise a web page or other type of content.

Next, a general discussion of the operation of the data communications network **100** is provided according to various embodiments. To begin, assume that a user manipulates the browser application **146** in the client **106** in order to search for one or more items **136** offered by an online merchant through the electronic commerce application **126**. In such case, the items **136** comprise, for example, products offered for sale by the online merchant in accordance with one embodiment of the present disclosure. Alternatively, the user may be performing a search for items **136** other than products in some other context as can be appreciated.

In one embodiment, a user may enter a search string into a search text box in a network page **149** in order to initiate a search for desired items **136**. To this end, some users mistakenly believe that the search text box is to be used to describe the specific item **136** in detail. Such a user may enter a long search string that tends to describe what they are looking for in detail rather than entering a strategically crafted set of keywords to facilitate an effective search for desired items **136**. For example, a user who wishes to buy a hat for the beach might enter a search string that states "I am looking for a hat for the beach having yellow ribbon and a large rim for protection against the sun" or something comparable.

Such a search string may be unlikely to result in a query that will produce a meaningful group of products to review due to the fact that the search string is overly constrained as it has too many terms. In fact, it may be likely that the above search string would result in zero products in response to a corresponding query submitted to a product catalog, etc. In addition, there may be other reasons why queries generated from search strings do not return results.

In some situations, a user may get discouraged due to the fact that zero results were obtained based upon the search string that they entered. Less sophisticated users may conclude that the online merchant does not carry items **136** that were described in the search string. As a result, the user may be discouraged from making a purchase with the online merchant. This correspondingly results in numerous lost sales for online merchants.

In addition, it may be the case that various queries may be formulated from the search string that was entered by a user. Specifically, each query may be generated based upon part of the search string. The results of multiple such queries may be combined to provide a result for the search. However, the problem with such an approach is that it is possible that irrelevant items **136** may be included in a search result generated based upon part of the entire search string. That is to say, a query generated based upon part of the search string may be too broad, thereby identifying items **136** that are unrelated to the search string. If such irrelevant items **136** are displayed in the results, a user may lose faith that a search performed on the network presence of an online merchant will reveal relevant results. This too may discourage further user participation resulting in lost sales.

In accordance with various embodiments, a user may execute a browser application **146** to access a network site served up by the electronic commerce application **126**. In doing so, according to one embodiment, assume that the user wishes to search through the items **136** stored in the data store **116** for one or more items **136** that they may wish to purchase. To this end, the electronic commerce application **126** may serve up one or more network pages **149** that facilitate the entry of a search string by the user. Such search strings may be entered into various components of a network page **149** that is rendered on a display device **143** of the client **106**.

Alternatively, the user may enter a search string for some other purpose other than identifying items **136** for purchase. For example, the search string may be used to perform a web search or for some other purpose.

In addition, the user may enter a search string through a voice interface over a suitable voice communications system using telecommunications networks such as plain old telephone services (POTS), digital telephone networks, voice-over-IP systems, and the like.

During the course of the ordinary operation of the electronic commerce application **126**, the user may submit a search string in an attempt to identify items **136** that the user wishes to purchase. The search engine **129** generates a query from the search string and submits the same to the product catalog application **133** to ultimately query the items **136** stored in the data store **116** to determine those products relevant to the search string. In response, the product catalog application **133** sends a listing of one or more items **136** that are responsive to the query. The electronic commerce application **126** then generates a network page **149** that is transmitted to the client **106** that lists the items **136** that are responsive to the search string entered by the user.

In some situations, it may be the case that few or no items **136** can be identified based upon the search string. According to various embodiments, a search engine **129** is provided that detects when a query that is generated from a search string fails to identify at least a predefined threshold number of items **136** from those stored in the data store **116**. The predefined threshold number may be specified based upon the nature of the searching function performed. For example, in one embodiment, a threshold of 10 items may be specified, although it may be any number as can be appreciated.

When the search engine **129** detects that a query generated from a search string failed to identify one or more items **136** from those stored in the data store **116**, the search engine **129** is configured to generate one or more altered versions of the search string by making various modifications to the search string. For each altered version of the search string, a query is submitted to the product catalog application **123** so as to query the items **136** in the data store **116**. Such queries are identified herein as "second queries." Assuming that at least one of the second queries identifies at least one item **136** from the data store **116**, then the electronic commerce application **126** proceeds to generate a network page **149** that comprises a presentation of the items **136** identified in the respective second queries submitted to the data store **116**.

According to one embodiment, the presentation of the network page **149** may show two or more separate groups of items **136** that result from corresponding ones of the second queries. Associated within the presentation of each respective group of items **136** is the total number of items **136** in the group. The network page **149** is generated so as to be rendered

on a rendering device such as the display device **143** of the client **106** or other rendering device. Alternatively, such other rendering devices may comprise, for example, printers or other devices.

According to various embodiments, each group of items **136** displayed in a respective network page **149** allows a user to select a respective one of the groups as most relevant to the search originally performed by entering the original search string. Thus, the display of multiple groups of items **136** corresponding to multiple variations of the original search string entered by the user advantageously informs the user that the original search string revealed no results. At the same time, the display of multiple groups of items **136** increases the possibility that at least one of the groups displayed may have high relevance to the subject matter of the original search string.

To this end, a user who may be less sophisticated and does not appreciate that a search string can be too narrow is thus informed that the search string entered was problematic. At the same time, the user is still presented with viable results. Also, given that one of the different groups of items **136** that result from the respective second queries may not be relevant to the original search string due to the alteration made to the original search string, a user may not select such a group where other groups appear to be more relevant. This prevents a user from believing that the search function itself is random in nature and a waste of time.

In addition, the resulting network page **149** presents the respective groups of items **136** identified in response to the second queries in a manner that facilitates the selection of a respective one of the groups of items **136** to be rendered in a separate network page **149** apart from the other groups of items **136**. Accordingly, a user may select the particular group of items **136** that is most relevant to the search that they had attempted to perform.

To generate the altered versions of the search string entered by a user, the search engine **129** may perform various functions with respect to the search string. Alternatively, the same functions may be performed on the original search string as the preconditioning or treatment of the original search string before a corresponding query is submitted to the product catalog application **133** as will be described.

The various types of actions that may be taken to condition or otherwise alter a search string may comprise, for example, removing one or more terms from the search string, or eliminating duplicate terms from the search string. Still further, the search engine **129** may be configured to apply a weight to each of the terms in a search string based upon a frequency data that indicates the frequency of use of such terms in searching or other frequency of use as can be appreciated. Such frequency data may be obtained from various sources. Also, two or more terms within a given search string may be recognized as a literal phrase to be employed within a query, where the literal phrase may be treated like a single term as described herein. Thereafter, search terms may be eliminated from the search string based upon the weights assigned.

For example, one or more of the terms having the smallest or largest weights may be eliminated from the search string as can be appreciated. The terms may be removed from the search string in any order such as, for example, from left to right, right to left, at random, or via some other order as can be appreciated. For example, it may be determined that a higher weight indicates a greater frequency of usage, thereby indicating that such term may be of greater importance in a corresponding search. Accordingly, such term may be afforded a high weight that prevents such term from being eliminated from the search string before being applied as a query to the items **136** in the data store **116**.

In addition, the search engine **129** may perform a spell correction on one or more of the terms in the search string, or may perform other actions with respect to the search string in either generating the first query based upon the search string, or on second queries based on altered versions of the search string. In one example, the search engine **129** may remove so-called "stop words" or other terms that are commonly known to have little relevance to a search. Such terms may comprise, for example, terms such as "a," "in," or other terms as can be appreciated.

As was mentioned above, where two or more terms are recognized as a literal phrase, such two or more terms may be treated as a single term even though there are two or more terms in the phrase. Thus, a search term as understood herein may comprise a single term or a literal phrase taken as a single term.

With reference to FIG. **2**, shown is one example of a network page **149** that is generated by the electronic commerce application **126** in accordance with the various embodiments. In one embodiment, the network page **149** is served up to the client **106** (FIG. **1**) and displayed on the display device **143** (FIG. **1**) or is rendered in some other manner as can be appreciated. The network page **149** displays separate groups **153** of items **136** taken from the data store **116** (FIG. **1**). Each of the groups **153** is presented separately from the other ones of the groups **153**.

The network page **149** also includes a search text box **156** in which a search string **159** appears. The search string **159** is entered by a user in order to provide the parameters by which a search of the items **136** can be performed to identify those items **136** that the user wished to view or purchase. According to one embodiment, the search string **159** does not provide any results for a search performed among the items **136** in the data store **116**. Such an occurrence may be due to the fact that, for example, the search string **159** is too long, making it too narrow in scope. Therefore, according to the various embodiments, the search engine **129** generates a plurality of altered versions of the search string **159** that are displayed as altered search strings **163** in the network page **149**. That is to say that each altered search string **163** comprises an altered version of the search string **159** originally entered by a user. Each altered search string **163** is graphically associated with a group **153** of items **136** identified based upon a second query generated from the altered search string **163** itself.

To the extent that all of the items **136** in a given group **153** do not fit within a single horizontal row in the network page **149**, then a link **166** is associated with the respective group **153** that may be manipulated by the user in order to view a subsequent network page **149** that includes all of the results for the respective group **153** that are presented apart from the other groups **153** of items **136**. In addition, each altered search string **163** may be presented as a link that may be clicked upon to facilitate a selection of such group **153** to be presented in a separate network page **149** apart from other groups **153** of items **136**. The link **166** sets forth a total number of the items **136** in a respective group **153**.

According to one embodiment, a limited number of groups **153** are selected to be displayed as part of the network page **149**. For example, the number of groups **153** of items **136** generated depends upon the number of different altered search strings **163** that are generated from the search string **159**. In one embodiment, all groups **153** having at least one item **136** that were identified based upon a respective altered search string **163** are presented as part of the network page **149**. To this end, a scrolling mechanism may be employed in

cases where all of the groups **153** presented do not fit within a single screen or other rendering. Alternatively, a limited number of the possible groups **153** may be presented in the network page **149** based upon predefined criteria. For example, it may be the case that a limited number of the groups **153** are included in the network page **149** having the most items **136** associated therewith. For example, it may be desirable to present the top four or five groups **153** having the most items **136**. Alternatively, some other criteria may be used to identify the groups **153** to be rendered.

The groups **153** may be presented in the network page **149** according to a predefined order or priority. Such priority may be determined based upon any one of a number of factors such as, for example, the number of items **136** within a given group **153**, the prices associated with the groups **153**, the availability of items **136** within the groups **153**, or other factors as can be appreciated.

The fact that the items **136** are displayed in the network page **149** in separate groups **153** along with the associated altered search strings **163** allows a user to see how other permutations of the original search string **159** they entered may pull up groups **153** of items **136** when the original search string **159** revealed no results. As a consequence, a user is disabused of the belief that the particular online merchant does not carry products relevant to their search. Also, given that the altered search strings **163** are displayed in association with respective groups **153** of items **136**, a user can see how the alteration made to the respective altered search string **163** may have resulted in items **136** listed in a group **153** that are not particularly relevant to the search string **159** that was entered.

Accordingly, the user advantageously receives results to a search even though the search string **159** that they entered would result in no identified items **136** from a corresponding search. Further, the network page **149** serves to educate users as to how to enter search strings **159** as they can compare and contrast the search string **159** they entered into a search text box **156** with the altered search strings **163** shown in the network page **149** relative to the number of items **136** that were identified for such altered search strings **153**.

With reference to FIG. **3**, shown is one example of a flowchart that illustrates one example of functionality of the search engine **129** according to various embodiments. The functionality of FIG. **3** may be implemented when it is detected that a first query generated from a search string **159** (FIG. **2**) entered by a user failed to identify at least one item **136** (FIG. **1**) from among all of the items **136** in the data store **116** (FIG. **1**) that match the query. To this end, such a query may be too narrow in scope such that it includes too many search terms or may have other problems as can be appreciated.

To begin, in box **203**, the search engine **129** conditions the search string **159** for the generation of subsequent queries. To this end, various actions may be taken with respect to the search string **159** such as, for example, applying spell correction to any terms misspelled in the search string **159**. Also, unsearchable words may be eliminated from the search string **159** such as "a," "and," or other like terms. Further, the search string **159** may be conditioned by removing any duplicate words within the search string **159** or by applying phrase recognition to tie two or more words together in a literal phrase to be searched. In addition, other conditioning steps may be taken to better position the search string **159** for the generation of appropriate queries.

The search string **159** that was entered by the user may be conditioned before a corresponding query is generated in an initial determination as to whether any items **136** can be identified. When the search engine **129** detects that there are no results for a query generated based upon the original search string **159**, then the functionality as depicted in FIG. **3** may be implemented where box **203** is skipped over if the search string **159** has been conditioned prior to the original search.

Next, in box **206** the search string **159** is altered and a corresponding query is generated to be submitted to the data store **116** by the product catalog application **133** (FIG. **1**). Such an alteration may comprise, for example, removing one or more terms from the search string **159**. The terms may be removed in any order such as from left to right, right to left, at random, or based upon some other scheme. Also, the terms within a search string **159** may be weighted according to the frequency of use of such terms. Thereafter, the terms may be removed based upon the weights assigned. For example, the terms may be removed according to the weights assigned starting with the lowest to the highest. Note that for each alteration, only a single term may be eliminated initially until all terms have been removed. Thereafter, combinations of two or more terms may be removed for further alterations. In addition, other alterations may be performed such as spell correction, literal phrase recognition, removal of stop terms, and any other alterations as described above. In some cases such alterations may have been made when pre-conditioning the search string **159**.

Then, in box **209**, the query is submitted to the data store **116** through the product catalog application **133**. In box **213**, if at least a predefined threshold number of items **136** are found responsive to the query, then the search engine **129** proceeds to box **216**. Otherwise, the search engine **129** progresses to box **219**. In one embodiment, the predefined threshold number of items **136** may be 1, 5, 10, or any other threshold number that is deemed appropriate. In one embodiment, the predefined threshold number is specified based upon the number of items that would be considered sparse relative to the type of search function performed and a generally expected number of results by users.

In box **216**, the set of identified items **136** are stored to potentially surface to the user in an appropriate network page **149** or other user interface as described above. Thereafter, in box **219**, the search engine **129** determines whether another alteration of the search string **159** is to be made. If so, then the search engine **129** reverts back to box **206**. Note that a limited number of alterations to the search string **159** may be made based upon a predefined limit or some other criteria. For example, the number of alterations made to the search string **159** may depend upon the total number of possible alterations that can be made to the search string **159**.

Assuming that there are no further alterations to be made to the search string **159** as determined in box **219**, then in box **223** the search engine **129** determines which of the groups **153** (FIG. **2**) of items **136** identified are to be surfaced to a user in the form of a network page **149** or other user interface. In one embodiment, a network page **149** may accommodate a limited number of groups **153**, where the total number of groups **153** may be limited to a predefined number. Alternatively, all of the groups **153** may be included within a network page **149** where scrolling or other techniques are used to show the various groups **153** if they do not fit within one display or other rendering. Still further, only groups **153** that include a predefined minimum number of items **136** may be included in a network page **149**. Alternatively, other approaches may be employed to determine those groups **153** that are to be surfaced to a user.

In box **226**, any of the groups **153** that are to be surfaced to the user in a network page **149** or other user interface are

ranked based on predefined criteria. For example, in one embodiment, the groups **153** may be ranked according to the total number of items **136** in the group **153**, where the groups **153** are ranked from highest to lowest. Also, other factors may bear on the ranking of the groups **153** that are to be surfaced to a user such as, for example, availability of items **136**, factors relating to the queries performed for each group **153**, or other factors.

Thereafter, in box **229**, a network page **149** is generated having the respective groups **153** of identified items **136**. Such a network page **149** is served up to a client **106** (FIG. **1**).

Referring next to FIG. **4** shown is a schematic block diagram of one example of the server **103** according to an embodiment of the present disclosure. The server **103** includes at least one processor circuit, for example, having a processor **303** and a memory **306**, both of which are coupled to a local interface **309**. To this end, the server **103** may comprise, for example, a server computer or like device. The local interface **309** may comprise, for example, a data bus with an accompanying address/control bus or other bus structure as can be appreciated.

Stored in the memory **306** are several components and/or applications that are executable by the processor **303** and data that may be employed by such components and/or applications. In particular, stored in the memory **306** and executable by the processor **303** are a server operating system **313**, the electronic commerce application(s) **126**, the network server application(s) **123**, and potentially other applications. The electronic commerce application **126** includes, for example, the search engine **129**, the product catalog application **133**, and other applications/engines. Also, according to one embodiment, the data store **116** in which the items **136** (FIG. **1**) are stored is associated with the electronic commerce application **126** as described above. It is understood that there may be other applications that are stored in the memory **306** and are executable by the processor **303** as can be appreciated. Also, other data may be stored in the memory **306** and accessed by the processors **303** beyond the items **136** stored in the data store **116** as described above.

A number of software components are stored in the memory **306** and are executable or executed by the processor **303**. In this respect, the term "executable" means a program file that is in a form that can ultimately be run by the processor **303**. Examples of executable programs may be, for example, a compiled program that can be translated into machine code in a format that can be loaded into a random access portion of the memory **306** and run by the processor **303**, source code that may be expressed in proper format such as object code that is capable of being loaded into a random access portion of the memory **306** and executed by the processor **303**, or source code that may be interpreted by another executable program to generate instructions in a random access portion of the memory **306** to be executed by the processor **303**, etc. An executable program may be stored in any portion or component of the memory **306** including, for example, random access memory (RAM), read-only memory (ROM), hard drive, solid-state drive, USB flash drive, memory card, optical disc such as compact disc (CD) or digital versatile disc (DVD), floppy disk, magnetic tape, or other memory components.

The memory **306** is defined herein as both volatile and nonvolatile memory and data storage components. Volatile components are those that do not retain data values upon loss of power. Nonvolatile components are those that retain data upon a loss of power. Thus, the memory **306** may comprise, for example, random access memory (RAM), read-only memory (ROM), hard disk drives, solid-state drives, USB flash drives, memory cards accessed via a memory card reader, floppy disks accessed via an associated floppy disk drive, optical discs accessed via an optical disc drive, magnetic tapes accessed via an appropriate tape drive, and/or other memory components, or a combination of any two or more of these memory components. In addition, the RAM may comprise, for example, static random access memory (SRAM), dynamic random access memory (DRAM), or magnetic random access memory (MRAM) and other such devices. The ROM may comprise, for example, a programmable read-only memory (PROM), an erasable programmable read-only memory (EPROM), an electrically erasable programmable read-only memory (EEPROM), or other like memory device.

In addition, the processor **303** may represent multiple processors and the memory **306** may represent multiple memories that operate in parallel. In such a case, the local interface **309** may be an appropriate network that facilitates communication between any two of the multiple processors, between any processor and any one of the memories, or between any two of the memories etc. The local interface **309** may comprise additional systems designed to coordinate this communication, including, for example, performing load balancing. The processor **303** may be of electrical or of some other available construction.

The various applications, engines, network pages, and other components described above may be implemented using any one or more of a number of programming languages such as, for example, C, C++, C#, Visual Basic, VBScript, Java, JavaScript, Perl, Ruby, Python, Flash, Hypertext Markup Language (HTML), Extensible Markup Language (XML), or other programming languages.

Although the various applications and engines described above may be embodied in software or code executed by general purpose hardware, as an alternative the same may also be embodied in dedicated hardware or a combination of software/general purpose hardware and dedicated hardware. If embodied in dedicated hardware, the same can be implemented as a circuit or state machine that employs any one of or a combination of a number of technologies. These technologies may include, but are not limited to, discrete logic circuits having logic gates for implementing various logic functions upon an application of one or more data signals, application specific integrated circuits having appropriate logic gates, or other components, etc.

The flowchart of FIG. **3** shows examples of the functionality and operation of an implementation of the various applications described above. If embodied in software, each of the various blocks described may represent a module, segment, or portion of code that comprises program instructions to implement the specified logical function(s). The program instructions may be embodied in the form of source code that comprises human-readable statements written in a programming language or machine code that comprises numerical instructions recognizable by a suitable execution system such as a processor in a computer system or other system. The machine code may be converted from the source code, etc. If embodied in hardware, each block may represent a circuit or a number of interconnected circuits to implement the specified logical function(s).

Although the flowchart of FIG. **3** shows a specific order of execution, it is understood that the order of execution may differ from that which is depicted. For example, the order of execution of two or more blocks may be scrambled relative to the order shown. Also, two or more blocks shown in succession in FIG. **3** may be executed concurrently or with partial concurrence. In addition, any number of counters, state vari-

ables, warning semaphores, or messages might be added to the logical flow described herein, for purposes of enhanced utility, accounting, performance measurement, or providing troubleshooting aids, etc. It is understood that all such variations are within the scope of the present disclosure.

Also, where the various applications and/or engines described herein comprise software or code, each can be embodied in any computer-readable medium for use by or in connection with an instruction execution system such as, for example, a processor in a computer system or other system. In this sense, the applications and/or engines may comprise, for example, statements including instructions and declarations that can be fetched from the computer-readable medium and executed by the instruction execution system. In the context of the present disclosure, a "computer-readable medium" can be any medium that can contain, store, or maintain logic or code for use by or in connection with the instruction execution system. The computer readable medium can comprise any one of many physical media such as, for example, electronic, magnetic, optical, or semiconductor media. More specific examples of a suitable computer-readable medium would include, but are not limited to, magnetic tapes, magnetic floppy diskettes, magnetic hard drives, memory cards, solid-state drives, USB flash drives, or optical discs. Also, the computer-readable medium may be a random access memory (RAM) including, for example, static random access memory (SRAM) and dynamic random access memory (DRAM), or magnetic random access memory (MRAM). In addition, the computer-readable medium may be a read-only memory (ROM), a programmable read-only memory (PROM), an erasable programmable read-only memory (EPROM), an electrically erasable programmable read-only memory (EEPROM), or other type of memory device.

It should be emphasized that the above-described embodiments of the present disclosure are merely possible examples of implementations set forth for a clear understanding of the principles of the disclosure. Many variations and modifications may be made to the above-described embodiment(s) without departing substantially from the spirit and principles of the disclosure. All such modifications and variations are intended to be included herein within the scope of this disclosure and protected by the following claims.

Therefore, the following is claimed:

1. A method, comprising:

detecting when a first query generated from a search string in a computing device identifies less than a predefined threshold number of items from among a plurality of items in a data store, wherein the search string comprises a plurality of search terms;

generating, by a search engine, upon detection, a plurality of altered versions of the search string in the computing device that are restricted to containing a subset of the plurality of search terms of the search string, by performing at least one of the following:

removing at least one search term from the search string;

eliminating a duplicate search term from the search string; or

recognizing at least two terms in the search string as a literal phrase to be employed in a respective one of a plurality of second queries;

implementing, in the computing device, a submission of the plurality of second queries to the data store, each of the second queries corresponding to a respective one of the altered versions of the search string;

generating, in the computing device, a presentation of at least two separate groups of the items resulting from a corresponding at least two of the second queries to be rendered;

facilitating a selection of one of the at least two separate groups of the items in the presentation to be rendered apart from other groups of items; and

sending the presentation to a client to be rendered by the client.

2. The method of claim **1**, wherein for each of the at least two separate groups of the items, the method further comprises associating a total number of the items in the group with the presentation of the group of the items.

3. The method of claim **1**, wherein the search string is overly constrained, thereby resulting in a failure of the first query to identify the predefined threshold number of items from among the plurality of items in the data store.

4. A system, comprising:

a computing device; and

a search engine executed in the computing device, the search engine being configured to:

detect when a first query generated from a search string identifies less than a predefined threshold number of items from among a plurality of items stored in a data store accessible to the computing device, wherein the search string comprises a plurality of search terms;

generate, upon detection, a plurality of altered versions of the search string that are restricted to containing a subset of the plurality of search terms of the search string;

submit a plurality of second queries to the data store, each of the second queries corresponding to a respective one of the altered versions of the search string; and

generate a presentation of at least two separate groups of the items resulting from a corresponding at least two of the second queries to be rendered on a rendering device.

5. The system of claim **4**, wherein the search engine is further configured to:

detect when the first query generated from the search string identifies less than one of the items from among the plurality of items; and

generate at least a one of the altered versions of the search string based on removing the at least one search term of the search string.

6. The system of claim **4**, wherein the rendering device comprises one of a display device or a printer.

7. The system of claim **4**, further comprising an application executed in the computing device configured to send the presentation to a client to be rendered by the client.

8. The system of claim **4**, wherein the search engine is further configured to facilitate a selection of one of the at least two separate groups of the items in the presentation to be rendered apart from other groups of the items.

9. The system of claim **4**, wherein the search engine generates the plurality of altered versions of the search string by removing at least one term from the search string.

10. The system of claim **4**, wherein the search engine generates the plurality of altered versions of the search string by eliminating at least one duplicate term from the search string.

11. The system of claim **4**, wherein the search engine generates the plurality of altered versions of the search string by recognizing at least two terms in the search string as a literal phrase to be employed in a respective one of the second queries.

12. The system of claim **4**, wherein the search engine generates the plurality of altered versions of the search string by:

applying a weight to each of a plurality of terms in the search string based upon frequency data; and

eliminating at least one of the terms having a smallest weight from the search string.

13. The system of claim **4**, wherein the search string is overly constrained, thereby resulting in identifying less than the predefined threshold number of items from among the plurality of items in the data store.

14. A method, comprising:

detecting when a first query generated from a search string in a computing device identifies less than a threshold number of items from among a plurality of items in a data store;

generating, upon detection, a plurality of altered versions of the search string in the computing device that are restricted to containing a subset of search terms of the search string;

implementing, in the computing device, a submission of a plurality of second queries to the data store, each of the second queries corresponding to a respective one of the altered versions of the search string; and

generating, in the computing device, a presentation of at least two separate groups of the items resulting from a corresponding at least two of the second queries to be rendered.

15. The method of claim **14**, wherein detecting when the first query generated from the search string in the computing device identifies less than the threshold number of items from among the plurality of items in the data store further comprises detecting when the first query generated from the search string identifies less than one of the items from among the plurality of items.

16. The method of claim **14**, further comprising sending the presentation to a client to be rendered by the client.

17. The method of claim **14**, further comprising facilitating a selection of one of the at least two separate groups of the items in the presentation to be rendered apart from other groups of the items.

18. The method of claim **14**, wherein generating the plurality of altered versions of the search string further comprises removing at least one term from the search string.

19. The method of claim **18**, wherein the at least one term is removed from the search string from left to right.

20. The method of claim **14**, wherein for each of the at least two separate groups of the items, the method further comprises associating a total number of the items in a respective one of the at least two groups with the presentation of the at least two groups of the items.

21. The method of claim **14**, wherein generating the plurality of altered versions of the search string further comprises eliminating at least one duplicate term from the search string.

22. The method of claim **14**, wherein generating the plurality of altered versions of the search string further comprises recognizing at least two terms in the search string as a literal phrase to be employed in a respective one of the second queries.

23. The method of claim **14**, wherein generating the plurality of altered versions of the search string further comprises:

applying a weight to each of a plurality of terms in the search string based upon frequency data; and

eliminating at least one of the terms having a smallest weight from the search string.

24. The method of claim **14**, wherein generating the plurality of altered versions of the search string further comprises automatically correcting a spelling of at least one of a plurality of terms in the search string.

25. The method of claim **14**, wherein the search string is overly constrained, thereby resulting in identifying less than the threshold number of items from among the plurality of items in the data store.

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