



- (51) **International Patent Classification:**
G01C 21/36 (2006.01) *G06F 17/30* (2006.01)
- (21) **International Application Number:**
PCT/IB2011/001592
- (22) **International Filing Date:**
31 May 2011 (31.05.2011)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
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- (81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

- (84) **Designated States** (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

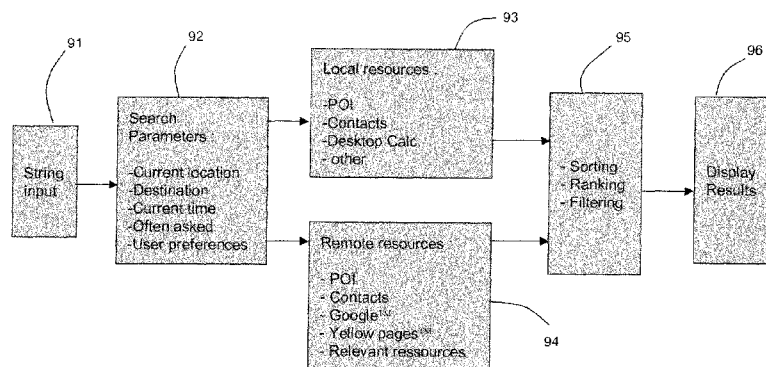
Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

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

- (54) **Title:** SYSTEM AND METHOD TO SEARCH, COLLECT AND PRESENT VARIOUS GEOLOCATED INFORMATION

FIG. 5

- (57) **Abstract:** Method carried out by a system adapted to search, collect and present various information in a system comprising a mobile device (1) having local applications (11) providing local services, a display device, geolocating means, a local search engine, remote servers (3), a host server (2) connected to remote servers through internet, a communication channel (4) between the mobile device and the host server, the method comprising the steps of: a keyword input step, a remote search step wherein the local search engine launches remote resources to collect information about target services relevant to the inputted keyword, current location and current time, a local search step, a sorting step wherein the local search engine sorts information collected in the remote search and local search steps, a presentation in which the sorted information is displayed.

**System and method to search, collect and present various
geolocated information**

FIELD OF THE INVENTION

5 The present invention relates to mobile devices having a system and method to search, collect and present various geolocated information.

BACKGROUND OF THE INVENTION

10 More precisely, mobile devices such as navigation systems are known to provide itinerary management and to display POIs (points of interest) to a user of such a navigation system. However, the available list of POIs often lacks of relevance and is not up-to-date.

15 The goal of the present invention is to improve the availability and relevance of the information searched and displayed to the user.

SUMMARY OF THE DISCLOSURE

20 According to the present invention, it is disclosed a method carried out by a system adapted to search, collect and present various information, in a system comprising:

25 - a mobile device having at least a local application providing local services, and a user output interface which is preferably a display device, wherein the mobile device comprises geolocating means to determine a current location,

 - remote servers having remote ressources,

 - at least a host server adapted to be connected to said remote servers through internet,

30 - a communication channel between said mobile device and said host server, said communication channel having at least a wireless portion,

 - a local search engine on the mobile device,

 wherein the method comprises the following steps :

35 a) a keyword input step wherein a keyword is inputted on the mobile device,

b) determining search parameters,

c) a remote search step, wherein the local search engine requests and launches, with said search parameters, through the host server, relevant remote resources to collect information about target services relevant to the inputted keyword and to the current location and to the current time,

e) a sorting step, wherein the local search engine sorts information about target services collected in the remote search step, according to sorting parameters, to result in a sorted information,

f) a presentation step, wherein the mobile device presents said sorted information about target services on the user output interface.

Thanks to these dispositions, the user of such system can easily indicate, through a simple keyword input, what kind of information he would like to get, and the disclosed method and system enables to collect remotely over internet various information relevant to the inputted keyword, and display the relevant information to the user. This method does not require any complicated operation from the user or any particular knowledge of the user and provides the user with relevant information from remote resources; it is therefore very user-friendly.

In various embodiments of the invention, one may possibly have recourse in addition to one and/or other of the following arrangements.

According to an aspect of the invention, the method further comprises a step of

d) a local search step wherein the local search engine identifies and launches relevant local applications to collect results of local services relevant to the inputted keyword and to the current location and to the current time, and, in the sorting step, the local search engine merges information collected in the local search step into

the information collected in the remote search step, and then sorts said merged information according to sorting parameters. Therefore, the relevant information provided to the user does not only include relevant information about target services coming from remote resources but also includes relevant information present in the mobile device.

According to an aspect of the invention, in the presentation step, the local search engine presents sorted information about target services on the display device using a graphical interface, preferably on a map display. Therefore, the user can easily identify the most interesting information and the user can easily spot on the map the most relevant target service matching its needs.

According to another aspect of the invention, the search parameters include at least one criteria among the following group of criteria:

- a set of user preferences,
- a set of user previous requests.

Therefore, the search is optimized regarding the user preferences and habits.

According to another aspect of the invention, the mobile device performs a guiding operation from the current location to a destination along an itinerary, said itinerary defining an itinerary corridor, wherein the search parameters include at least one criteria among the following group of criteria:

- locations included or close to the itinerary corridor,
- the distance from the current location to the target service location.

Therefore, the relevance of information is adapted to the itinerary planned for the user.

According to another aspect of the invention, the sorting parameters include at least one criteria among the following group of criteria:

- the distance of target service location to itinerary,
- the distance of target service location to the destination,
- working hours of target services,
- 5 - completion of information available for target services,
- a set of user preferences,
- popular rating of target services.

Therefore, the ranking of the relevant information is
10 adapted to the current position, the user preferences.

According to another aspect of the invention, in the local search step, the local search engine searches among at least one of the following services group comprising: a contact directory, a desktop calculator, a messaging
15 service, a music directory. Hence, the input of any keyword will lead to a relevant result, even if the keyword is intended to designate a local service.

The present invention is also directed to a system adapted to search, collect and present various information
20 said system comprising:

- a mobile device having at least a local application providing local services, and a user output interface which is preferably a display device, wherein the mobile device comprises geolocating means to determine a current
25 location,
 - remote servers having remote resources,
 - at least a host server adapted to be connected to said remote servers through internet,
 - a communication channel between said mobile device
30 and said host server, said communication channel having at least a wireless portion,
 - a local search engine, on the mobile device, adapted to accept an input of a keyword,
- wherein the local search engine is adapted to identify and
35 launch, through the host server according to search

parameters, relevant remote resources to collect information about target services relevant to the inputted keyword and relevant to the current location and relevant to the current time,

5 wherein the local search engine is adapted to sort according to sorting parameters and present to the user the collected information about target services related to the inputted keyword and to the current location and to the current time. Therefore, the local search engine can launch
10 a plurality of remote resources through the host server, using only one communication channel, the host server playing the role of a dispatcher for the requests coming from the local search engine.

According to an aspect of the invention, the local
15 search engine is further adapted to identify and launch at least one relevant local application to collect results of local services relevant to the inputted keyword and to the current location and current time. Therefore, the relevant information provided to the user does not only include
20 relevant information about target services coming from remote resources but also includes relevant information present in the mobile device.

According to another aspect of the invention, the mobile device is adapted to perform a guiding operation
25 from the current location to a destination along an itinerary, said itinerary defining an itinerary corridor, wherein the search parameters include at least one criteria among the following group of criteria:

- a set of user preferences,
- 30 - a set of user previous requests,
- the distance from the current location to the target service location,
- locations included or close to itinerary corridor,
- and wherein the sorting parameters include at least one
35 criteria among the following group of criteria:

- the distance of target service location to itinerary,
- the distance of target service location to the target service location,
- working hours of target services,
- 5 - completion of information available for target services,
- a set of user preferences,
- popular rating of target services. Therefore, the relevance of information is adapted to the itinerary
- 10 planned for the user.

According to another aspect of the invention, the local application includes at least one of the following services from the group comprising: a contact directory, a desktop calculator, a messaging service. Hence, the input of any

15 keyword will lead to a relevant result, even if the keyword is intended to designate a local service.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of the invention appear from the following detailed description of one of its

20 embodiment, given by way of non-limiting example, and with reference to the accompanying drawings.

In the drawings:

- Figure 1 is a general view of the system according to the invention,
- 25 - Figure 2 is a diagram showing the messages involved in the method according to the invention,
- Figure 3 shows an example of a resulting display according to the invention,
- Figure 4a and 4b illustrate the keyword input step,
- 30 and
- Figure 5 is a diagram showing the different steps of a method according to the invention.

MORE DETAILED DESCRIPTION OF THE INVENTION

In the figures, the same references denote identical or

35 similar elements.

Figure 1 shows a system according to the invention. Said system comprises at least a mobile device 1 having at least a local application 11 providing local services, a local search engine 10 and a user output interface which is preferably a display device 5.

The mobile device 1 may be for example a Personal Navigation Device ('PND'), or a smart phone; said mobile device 1 may be typically used in a vehicle, but can also be used by a pedestrian, a cyclist, or any transportation means. Said mobile device 1 comprises geolocating means to determine a current location of the mobile device 1, such as a GPS receiver or any other equivalent device.

Further, the system comprises remote servers 3 having remote resources; said servers are connected to the internet network, and support a variety of resources, called 'remote resources' since they are located remotely from the mobile device. Said servers 3 are able to provide a plurality of services, some of them will be called in the following 'target services' as they are involved in the method of collection of information detailed below.

Further, the system also comprises at least a host server 2 adapted to be connected to said remote servers 3 through internet.

A communication channel 4 can be established between said mobile device 1 and said host server 2, said communication channel 4 having at least a wireless portion 40.

The method according to the invention involves several steps that are detailed here below.

Keyword input step

The mobile device 1 comprises a local search engine 10, said local search engine is adapted to accept an input of a keyword. Said keyword is a character string, which is entered one character after another, preferably by a touch screen interface available through the display of the

mobile device, but it could also be entered thanks to voice recognition and in particular character recognition.

Advantageously according to the invention, the local search engine 10 displays a list of possible choice
5 corresponding to the already entered characters, as depicted on Figures 4a and 4b; in Figure 4a, two character 'P' and 'h' have been entered, and a third character 'a' has been appended in Figure 4b; the longer is the string of characters, the more selective is the prompted list 16
10 below the input field 15.

In order to have an intelligent and efficient search, several functionalities could be used:

- At the very first key entered, it is proposed at the top on the prompted list the previous keyword input that
15 begin with this key. It will allow the user that uses frequently the same searches to strike less key to select the desired keyword.

- Through linguistic dictionary, a same word written in different languages will be recognized as the same word,
20 for instance 'Bruxelles' will be recognized as 'Brussels'.

- Aliases could be used as shortcuts, said shortcuts configuration is saved into user preferences. For instance the input key 'medic' will be a search for every pharmacies and hospitals near the user position. Aliases save time, it
25 allow the user to make complex search with a single keyword.

- A phonetic algorithm will be used to allow 'phonetic' writing. For instance, input keyword 'resto' will be recognized as 'restaurant'.

30 The list of possible choices displayed below the input field further includes all type of data available in the mobile device 1, like the people contacts, the music playlists, music directory elements, message topics, local application names (like 'PhotoshopTM' in the example), or
35 any other information present in the mobile device

including members of previously selected keyword lists.

Once a particular keyword has been selected by the user, as illustrated by the keyword 17 'pharmacy' in Fig 4b, the local search engine 10 may prepare a request to be
5 sent to the host server 2.

Determining search parameters

The request comprises the selected keyword and a set of search parameters. Said search parameters may comprise the current location of the mobile device, the current time,
10 and may further comprise a set of user preferences, (like the topics of interest, the preferred locations, the language preferences, etc), a set of user previous requests (like the preferred websites). It also includes a keyword profile that describes in a few keywords the user (like
15 'truck driver' or 'business man').

In the case when the mobile device, as navigation system, performs a guiding operation from the current location to a destination, an itinerary or route is defined together with an itinerary corridor. Said itinerary
20 corridor may be defined by all areas located at a distance from the itinerary which is below a predetermined distance.

In this case of guidance, the search parameters may also include one criteria among the following group of criteria:

- 25 - locations included or close to the itinerary corridor,
 - the distance from the current location to the target service location.

Remote search step

30 The request is transmitted from the mobile device 1 to the host server 2. This request, referred to as 50 in Figure 2, is not necessarily a 'HTTP' request, it may be a proprietary request designed to minimize the volume of data transmitted over the wireless portion 40 of the
35 communication channel 4.

The host server 2, in turn, analyses the content of the request 50, and prepare adapted copies 51,52,53 of the request to be transmitted to the remote servers 3, these adapted copies are standard HTTP client requests.

5 Hence, the process is optimized since a single request from the mobile device will be duplicated in several requests from the host server 2 to the remote servers 3 over high data rate internet.

10 In the example illustrated, the 'pharmacy' request will be forwarded as adapted copies under HTTP standard 'client' request to the 'yellow pagesTM' website 31, to the 'TellmewhereTM' website 32, and/or to any healthcare website 33, with appropriate parameters like the current location for example.

15 As a result, information about target services relevant to the inputted keyword is collected from the remote resources 31-33. Remote servers 3 transmit responses 61,62,63 to the host server 2. In the exemplified case, a first list of pharmacies in the concerned area is sent from
20 'yellow pagesTM' website in a first message 61, a second list of pharmacies in the concerned area is sent from 'TellmewhereTM' website in a second message 62, and a third list of pharmacies is sent from the city healthcare website in a third message 63. Said host server 2 discard all
25 unnecessary information from the resulting information in the three messages 71,72,73 and sends the relevant result to the mobile device 1.

Sorting step

30 In this step, the local search engine sorts the collected information about target services related to the inputted keyword and to the current location and to the current time according to sorting parameters.

35 In the exemplified case, the three list of pharmacies coming from the three messages 71,72,73 are merged into a single list wherein the duplicates are eliminated.

Then a sorting operation is performed according to sorting parameters: the search engine ranks or orders the items in the collected information by their relevance against the sorting parameters. For example, the 'pharmacy' items present in the list may be ranked by the distance of their location from the target service location, or by the additional time cost due to the detour if the user follows an itinerary.

The items whose location is outside the itinerary corridor are ignored or placed in a low ranking position if the number of items is small enough.

Different types of sorting parameters may be used by the sorting operation:

- the distance or time cost of the detour of target service location to itinerary as explained above,

- the distance of target service location to the target service location, as explained above,

- working hours of target services, which is taken into account to allocate a low ranking or ignore a service that is closed or will be closed by the time the user arrives at this location; this is made possible when the itinerary comprises the estimated time of arrival at intermediate locations and destination,

- completion of information available for target services, which is taken into account to allocate a low ranking or ignore a service for which only partial information is available, for example missing working hours,

- a set of user preferences, for example a higher ranking may be allocated to a service which has already been used by the user,

- popular rating of target services, which is taken into account to modify the ranking according to the ranking allocated by other users; for example if the keyword would be 'restaurant', the popular rating parameter includes the

weight of positive/negative feedbacks of previous customers.

- social network feedbacks of target services, higher rank will be given to target services that have been
5 selected and used by users that share keyword profile with the current user.

Further, if the mobile device may be located in a vehicle having a particular size like a truck and/or a particular fuel type like LPG.

10 In this case, the sorting step filters the results according to the vehicle fuel type and size, whereby only target services located in accessible locations to this vehicle type and size are selected; for example, if downtown traffic is forbidden to trucks, an 'item' pharmacy
15 located in downtown area will be allocated a low ranking if the concerned vehicle is a truck.

Presentation step

As already explained, the mobile device comprises an output interface. This output interface may be an audio
20 interface using voice synthesis, which spells the result of the sorting step.

However, advantageously according to the invention, the mobile device 1 uses a display device 5 to present the sorted information about target services. Preferably, the
25 mobile device uses a graphical interface, for instance a map display, as exemplified on Figure 3. As shown in Figure 3, the mobile device 1 is located at the current location 24 and is under guidance along an itinerary 23 to the destination 25.

30 The user has selected the keyword 'pharmacy' as already explained. The result of the sorting step is displayed graphically: in the depicted case, five items corresponding to the keyword and to other search parameters and sorting parameters are displayed.

35 When the user interacts with a service, the device

sends to the server a feedback with the association of user's keyword profile and said service, this information will be used for the social network sorting feature.

The item which is allocated the higher rank exhibits
5 number '1', i.e. 'Pharmacy Maumont, 12 rue Poupart, 93 120
Noisy le Gd', ref. 29. Other proposed pharmacy items
26,27,28,80 exhibit number '2','3','4','5' according to
their relevance, in particular in accordance with the
sorting parameters.

10 Of course, the user may click on one box to show
additional information available about the concerned item.

It is to be noted that working hours may be displayed
on the main display like in the sub-box 81 attached to the
main box 80.

15 Additionally, previously searched items and/or other
POIs may be displayed in shadow.

Local search step

Additionally to the remote step search, the local
search engine may perform a local search step in which it
20 identifies and launches relevant local applications 11 to
collect results of local services relevant to the inputted
keyword and to the current location and to the current
time. As a matter of fact, some local applications may
include geolocated information, like POIs or other data
25 relevant to the searched items.

In the sorting step, the local search engine merges
information collected in the local search step into the
information collected in the remote search step. Then the
local search engine sorts said merged information according
30 to sorting parameters, as explained above.

Additionally, in the local search step, the local
search engine also searches among general purpose local
services. For instances, the general purpose local services
may include: a contact directory, a desktop calculator, a
35 messaging service, a music directory, bookmarks, etc...

Therefore, the input of any keyword will lead to a relevant result, even if the keyword is intended to designate a local service.

As shown in Figure 5, the method can be represented by
5 a succession of steps: the keyword input step 91, the search parameters determination 92, the remote search step 94 , the local search step 93, the sorting step 95 and the presentation step 96.

Additionally, during the remote search step, the
10 adapted copies 51-53 of the request may be targeted to a non-free information service. In this case, the response given by the remote resource 31-33 will contain the number of hits collected by the concerned request, but will not comprise the actual content of the available information.
15 In this case, the sorting and presentation steps may comprise a special behaviour to notify the user about the possibility to subscribe this non-free service.

It is to be noted that the invention encompasses any other kind of services useful to users like restaurants,
20 hairdressers, groceries, parking lots, car wash, cinemas, post office, police office, city hall services, etc... all available through a simple keyword input.

CLAIMS

1. Method carried out by a system adapted to search,
collect and present various information, in a system
5 comprising:

- a mobile device (1) having at least a local
application (11) providing local services, and a user
output interface which is preferably a display device,
wherein the mobile device comprises geolocating means to
10 determine a current location (24),

- remote servers (3) having remote resources,

- at least a host server (2) connected to said remote
servers through internet,

- a communication channel (4) between said mobile
15 device and said host server, said communication channel
having at least a wireless portion,

- a local search engine (10) on the mobile device,

wherein the method comprises the following steps :

- a) a keyword input step, wherein a keyword is
20 inputted on the mobile device,

- b) determining search parameters,

- c) a remote search step, wherein the local search
engine requests and launches, with said search parameters,
through the host server, relevant remote resources to
25 collect information about target services relevant to the
inputted keyword and to the current location and to the
current time,

- e) a sorting step, wherein the local search engine
sorts information about target services collected in the
30 remote search step, according to sorting parameters, to
result in a sorted information,

- f) a presentation step, wherein the mobile device
presents said sorted information about target services on
the user output interface.

35 2. Method according to the claim 1, comprising a step

of

d) a local search step wherein the local search engine identifies and launches relevant local applications (11) to collect results of local services relevant to the inputted keyword and to the current location and to the current time, and wherein, in the sorting step, the local search engine merges information collected in the local search step into the information collected in the remote search step, and then sorts said merged information according to sorting parameters.

3. Method according to any of the claims 1 or 2, wherein in the presentation step, the mobile device (1) presents sorted information about target services on the display device using a graphical interface (5), preferably on a map display.

4. Method according to any of the claims 1 or 3, wherein the search parameters include at least one criteria among the following group of criteria:

- a set of user preferences,
- a set of user previous requests.

5. Method according to any of the claims 1 to 4, wherein the mobile device performs a guiding operation from the current location (24) to a destination (25) along an itinerary, said itinerary defining an itinerary corridor, wherein the search parameters include at least one criteria among the following group of criteria:

- locations included or close to the itinerary corridor,
- the distance from the current location to the target service location.

6. Method according to any of the claims 1 to 5, wherein the sorting parameters include at least one criteria among the following group of criteria:

- the distance of target service location to itinerary,

- the distance of target service location to the destination,

- working hours of target services,

5 - completion of information available for target services,

- a set of user preferences,

- popular rating of target services.

7. Method according to any of the claims 1 to 6, wherein the mobile device is located in a vehicle having a size and a fuel type and wherein the sorting step filters the results according to the vehicle fuel type and size, whereby only target services located in accessible locations to this vehicle type and size are displayed.

8. Method according to any of the claims 1 to 7, wherein in the local search step, the local search engine searches among at least one of the following services group comprising: a contact directory, a desktop calculator, a messaging service.

9. System adapted to search, collect and present various information, said system comprising:

20 - a mobile device (1) having at least a local application (11) providing local services, and a user output interface which is preferably a display device, wherein the mobile device comprises geolocating means to determine a current location (24),

- remote servers (3) having remote resources,

- at least a host server (2) adapted to be connected to said remote servers through internet,

30 - a communication channel (4) between said mobile device and said host server, said communication channel having at least a wireless portion,

- a local search engine, on the mobile device, adapted to accept an input of a keyword,

35 wherein the local search engine is adapted to identify and launch, through the host server according to search

parameters, relevant remote resources (31-33) to collect information about target services relevant to the inputted keyword and relevant to the current location and relevant to the current time,

5 wherein the local search engine is adapted to sort according to sorting parameters and present to the user the collected information about target services related to the inputted keyword and to the current location and to the current time.

10 10. System according to the claim 9, wherein the local search engine (10) is further adapted to identify and launch at least one relevant local application (11) to collect results of local services relevant to the inputted keyword and to the current location and current time.

15 11. System according to the claim 9, wherein the mobile device is adapted to perform a guiding operation from the current location (24) to a destination (25) along an itinerary, said itinerary defining an itinerary corridor, wherein the search parameters include at least one criteria
20 among the following group of criteria:

- a set of user preferences,
- a set of user previous requests,
- the distance from the current location to the target service location,

25 - locations included or close to itinerary corridor,
and wherein the sorting parameters include at least one criteria among the following group of criteria:

- the distance of target service location to itinerary,
- the distance of target service location to the target

30 service location,

- working hours of target services,
- completion of information available for target services,

- a set of user preferences,

35 - popular rating of target services.

12. System according to the claim 9, wherein the local application include at least one of the following services from the group comprising: a contact directory, a desktop calculator, a messaging service.

1/3

FIG. 1

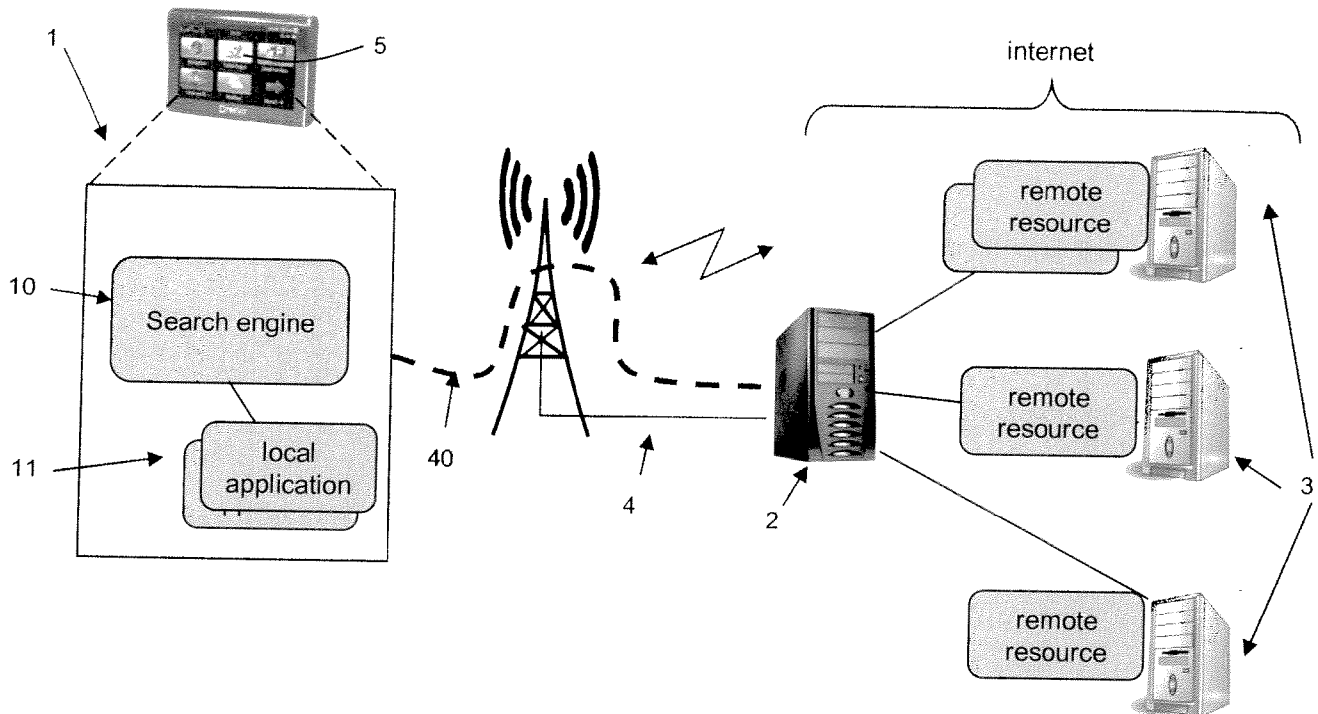
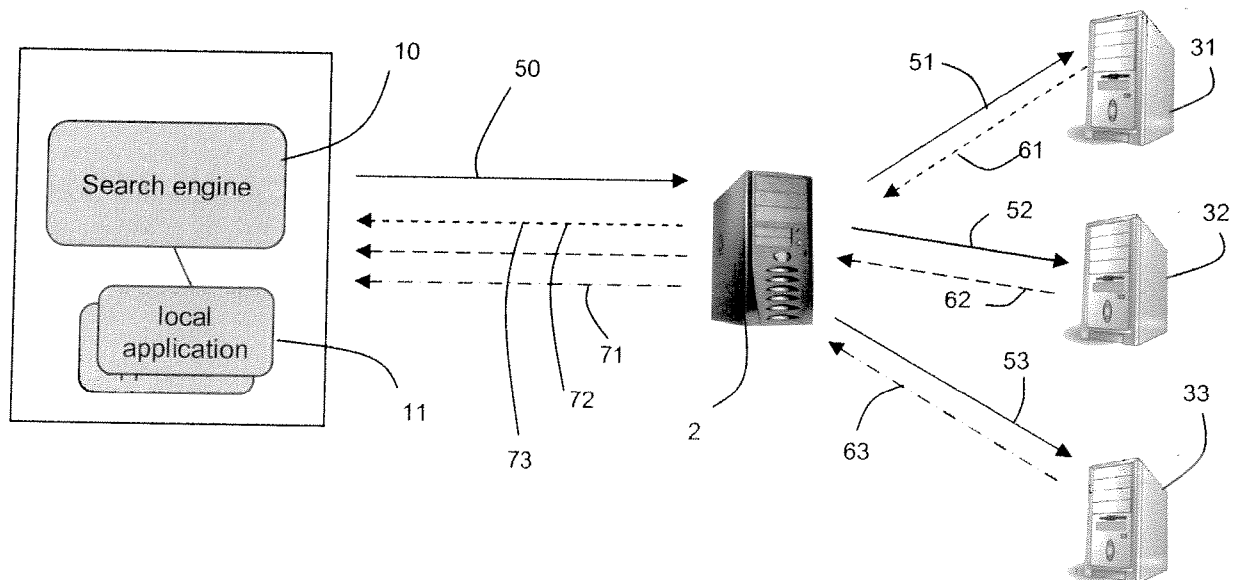


FIG. 2



2/3

FIG. 3

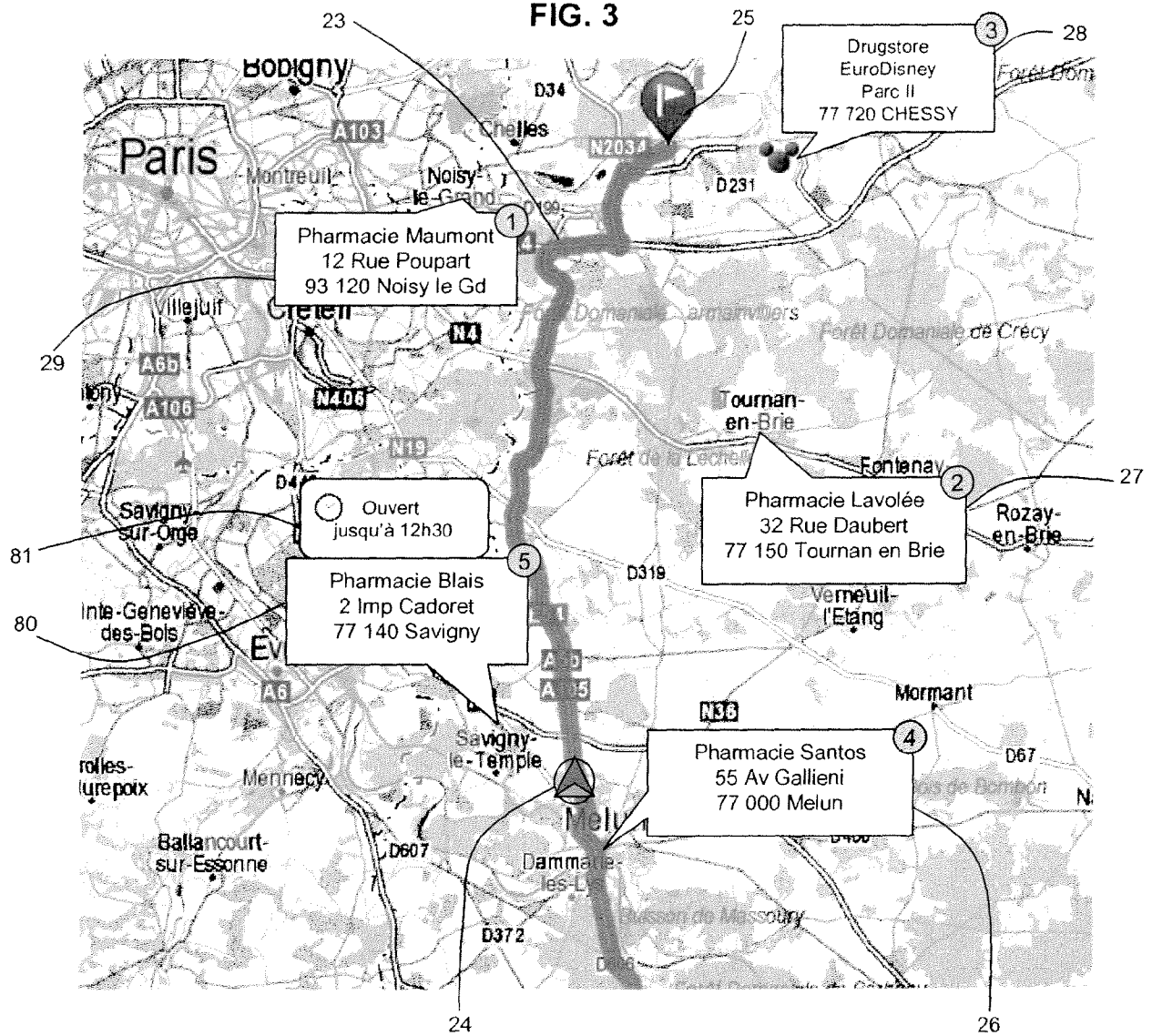


FIG. 4a

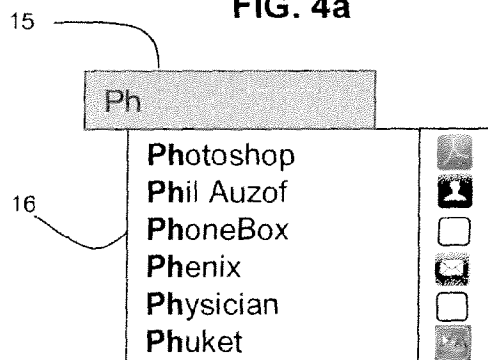
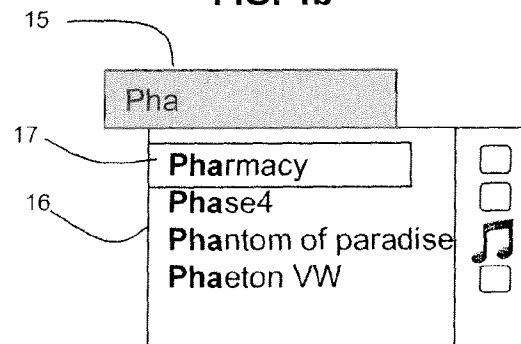
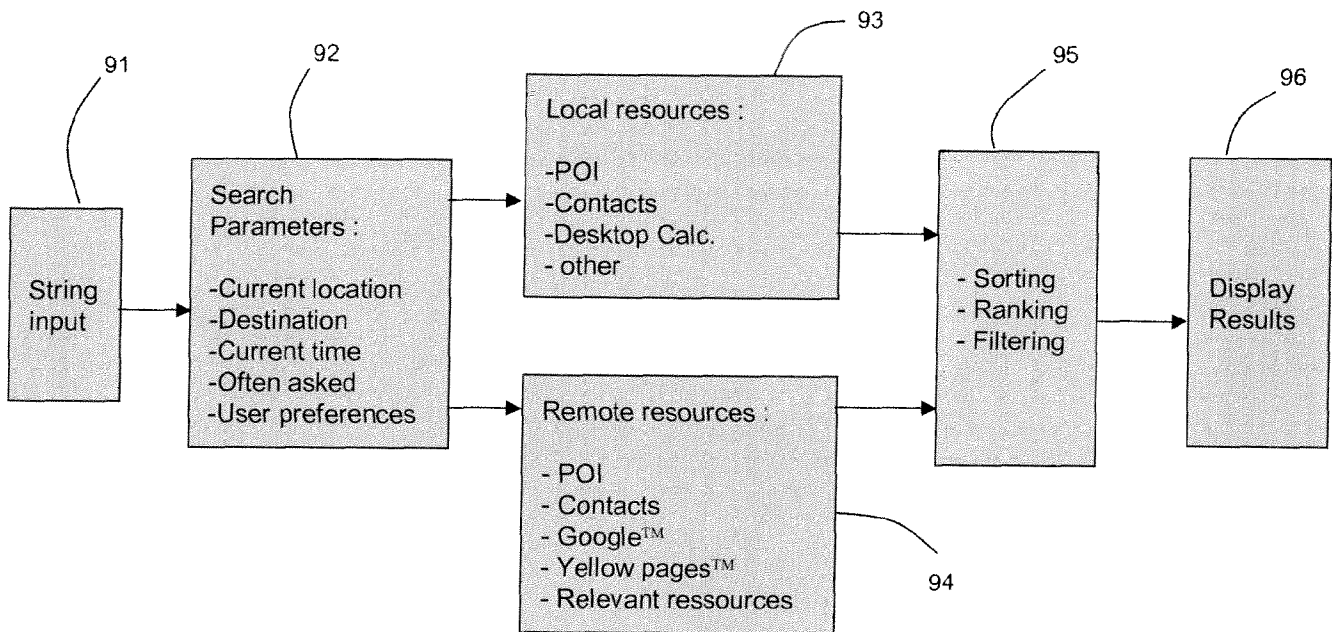


FIG. 4b



3/3

FIG. 5



INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2011/001592

A. CLASSIFICATION OF SUBJECT MATTER

INV. G01C21/36 G06F17/30
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G01C G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2010/051827 A1 (TOMTOM INT BV [NL]; ABEN SJOERD [NL]; THOMASSEN ERIK [NL]; DE HAAS TEU) 14 May 2010 (2010-05-14) page 1, line 5 - line 11 page 10, line 15 - line 25 page 16, line 29 - page 17, line 2 page 16, line 15 - line 18 page 14, line 4 - line 15 page 14, line 20 - line 25 page 7, line 20 page 20, line 9 - line 20 page 17, line 3 - line 9 page 19, line 20 - page 20, line 8 page 25, line 24 - line 35 page 4, line 35 - page 5, line 15 page 22, line 36 - page 23, line 7 claim 1 figures 6,13, 15 ----- -/-	1-12



Further documents are listed in the continuation of Box C.



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Date of the actual completion of the international search

19 January 2012

Date of mailing of the international search report

03/02/2012

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INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2011/001592

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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Y	US 2005/187971 A1 (HASSAN AHMED E [CA] ET AL) 25 August 2005 (2005-08-25) paragraphs [0015], [0017], [0029] claims 1,4,9 figures 1,6 -----	1-12
Y	EP 2 296 098 A2 (BEECHWOOD LTD PARTNERSHIP [CA]) 16 March 2011 (2011-03-16) paragraphs [0001] - [0005] claim 9 figures 7,10 -----	1-12
Y	Adam Pash: "Google Mobile Searches Your Contacts and the Web", 10 July 2008 (2008-07-10), XP002667448, Retrieved from the Internet: URL:http://lifehacker.com/398284/google-mobile-searches-your-contacts-and-the-web [retrieved on 2012-01-16] the whole document -----	1-12

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