US 20130124550A1

(19) **United States**

(12) **Patent Application Publication**

**OEL et al.**

(10) **Pub. No.: US 2013/0124550 A1**

(43) **Pub. Date: May 16, 2013**

(54) **METHOD AND APPARATUS FOR OPERATING A USER INTERFACE**

(71) Applicant: **Volkswagen AG**, Wolfsburg (DE)

(72) Inventors: **Peter OEL**, Lehre (DE); **Moritz NEUGEBAUER**, Berlin (DE); **Michael MISCHKE**, Hannover (DE); **Christoph WAELLER**, Braunschweig (DE); **Lorenz BOHRER**, Berlin (DE); **Jens EHRKE**, Isenbuettel (DE); **Gordon SEITZ**, Ehra-Lessien (DE); **Stefan SCHULZ**, Berlin (DE); **Imke GAUS**, Berlin (DE); **Oliver MEYER**, Berlin (DE)

(73) Assignee: **Volkswagen AG**, Wolfsburg (DE)

(21) Appl. No.: **13/668,676**

(22) Filed: **Nov. 5, 2012**

**Related U.S. Application Data**

(63) Continuation of application No. PCT/EP2011/001776, filed on Apr. 9, 2011.

(30) **Foreign Application Priority Data**

May 4, 2010 (DE) ..... DE102010019191.4

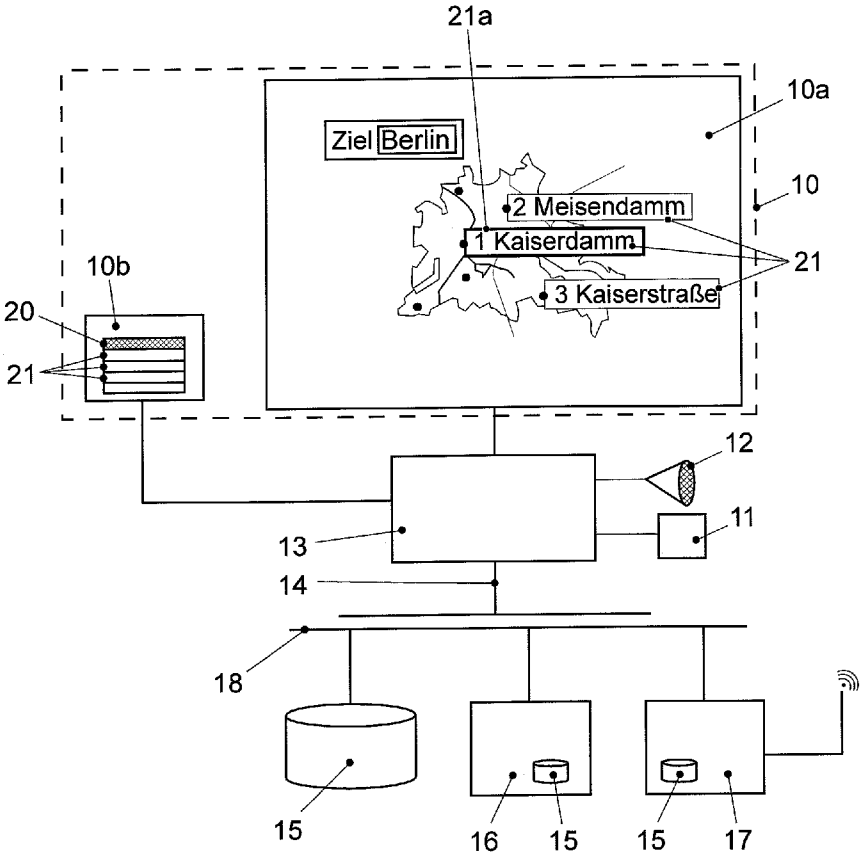
**Publication Classification**

(51) **Int. Cl.**
*G06F 17/30* (2006.01)

(52) **U.S. Cl.**
CPC ..... *G06F 17/30557* (2013.01)
USPC ..... **707/758**

(57) **ABSTRACT**

A method and apparatus for operating a user interface is provided, in which a first user input is detected, and a confidence analysis is carried out. Different kinds of system responses are generated depending on the result of the confidence analysis, wherein a first kind of system response comprises a system output which requires a second user input, and a second kind of system response comprises the automatic selection of a database entry. A third kind of system response comprises the first and second features, wherein the third kind of system response automatically changes into the first or second kind of system response after the expiry of a period of time. In this case, one of the two first kinds can be set as a standard or "default," into which the automatic change then takes place after expiry of the period of time without further user interaction.



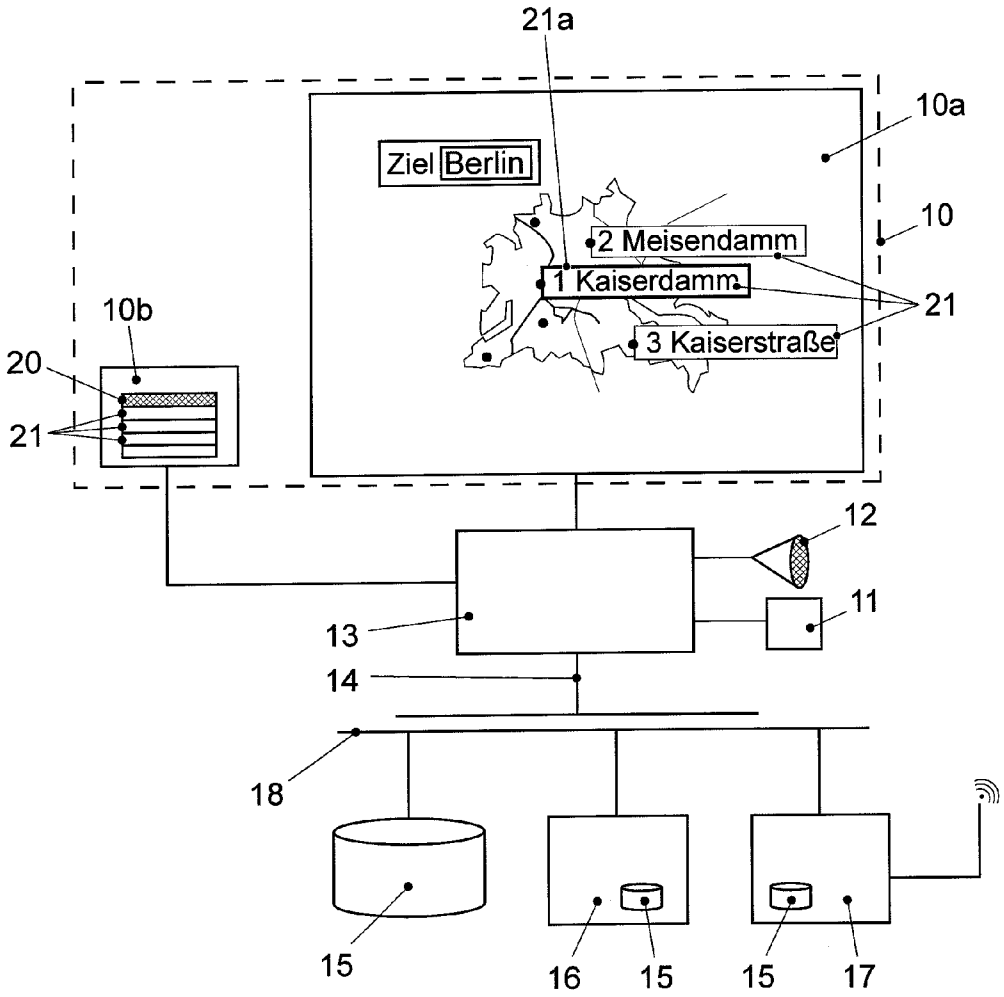



FIG. 1

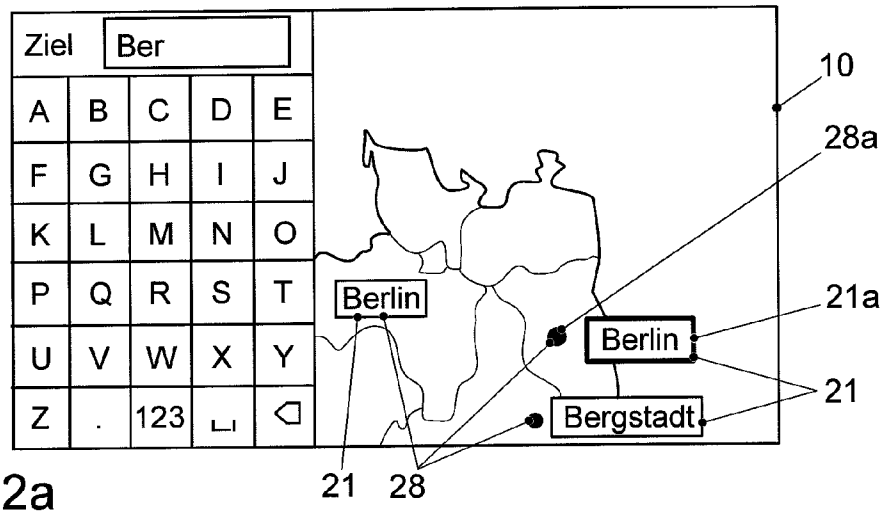



FIG. 2a

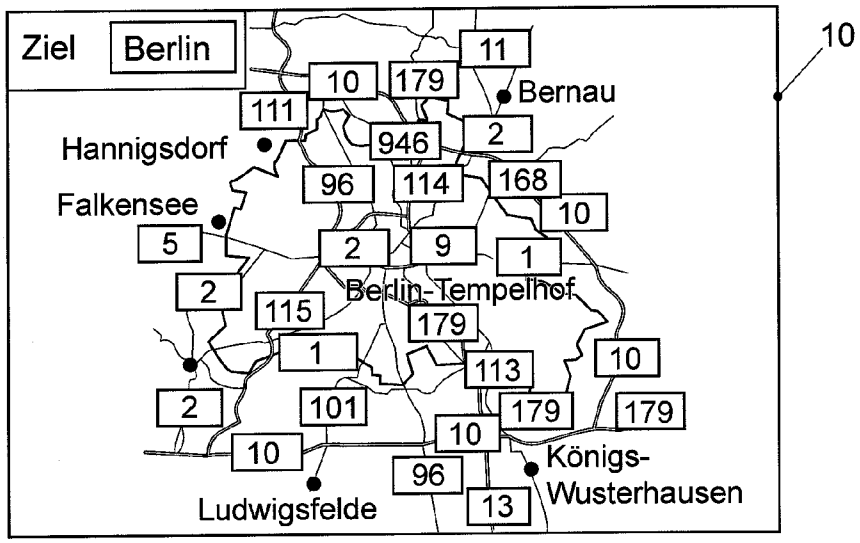



FIG. 2b

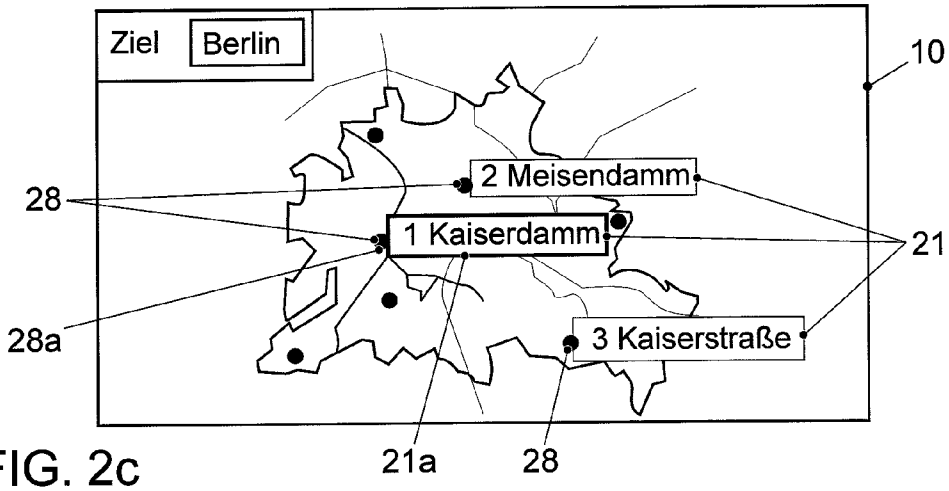
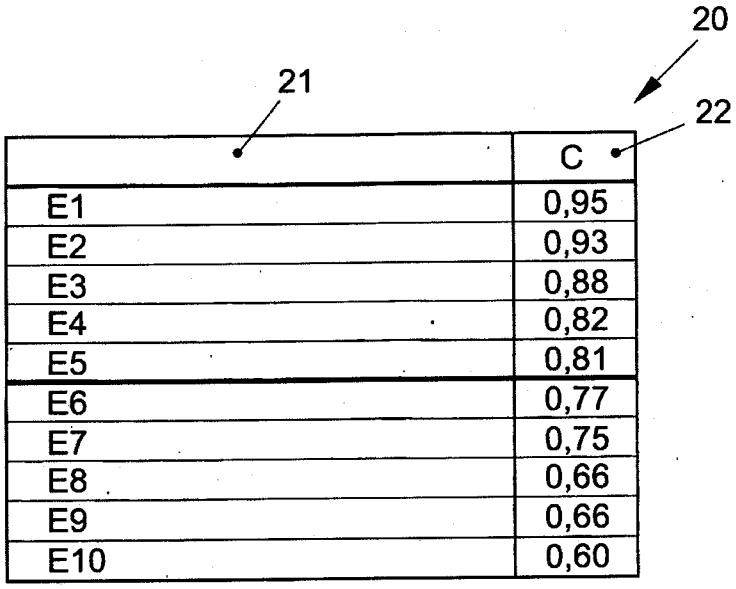
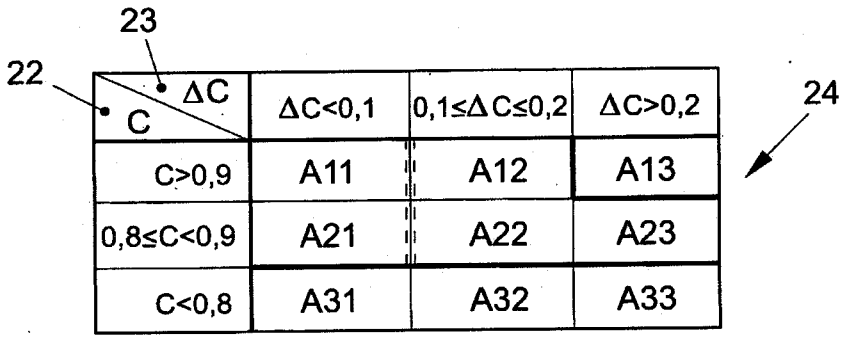



FIG. 2c



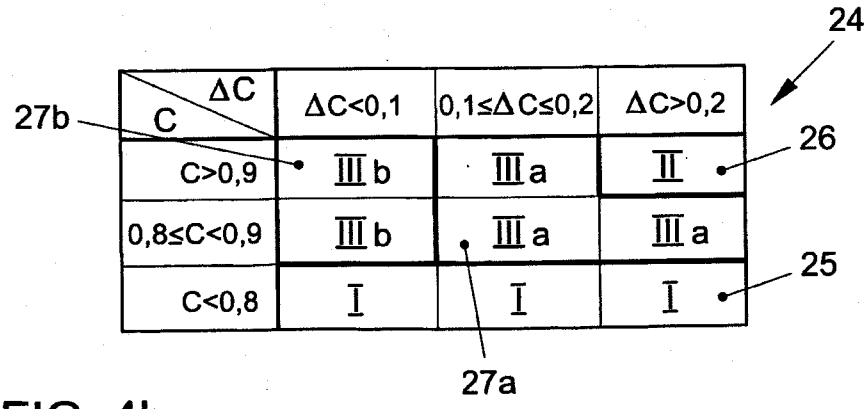

| | C |
|---|---|
| E1 | 0,95 |
| E2 | 0,93 |
| E3 | 0,88 |
| E4 | 0,82 |
| E5 | 0,81 |
| E6 | 0,77 |
| E7 | 0,75 |
| E8 | 0,66 |
| E9 | 0,66 |
| E10 | 0,60 |

FIG. 3




| C \ ΔC | ΔC<0,1 | 0,1≤ΔC≤0,2 | ΔC>0,2 |
|---|---|---|---|
| C>0,9 | A11 | A12 | A13 |
| 0,8≤C<0,9 | A21 | A22 | A23 |
| C<0,8 | A31 | A32 | A33 |

FIG. 4a




| C \ ΔC | ΔC<0,1 | 0,1≤ΔC≤0,2 | ΔC>0,2 |
|---|---|---|---|
| C>0,9 | III b | III a | II |
| 0,8≤C<0,9 | III b | III a | III a |
| C<0,8 | I | I | I |

FIG. 4b

# METHOD AND APPARATUS FOR OPERATING A USER INTERFACE

**[0001]** This nonprovisional application is a continuation of International Application No. PCT/EP2011/001776, which was filed on Apr. 9, 2011, and which claims priority to German Patent Application No. DE 10 2010 019 191.4, which was filed in Germany on May 4, 2010, and which are both herein incorporated by reference.

## BACKGROUND OF THE INVENTION

**[0002]** 1. Field of the Invention

**[0003]** The present invention relates to a method for operating a user interface, in which a first user input is detected, and a confidence analysis is carried out, during which the user input is compared with a plurality of stored database entries and each thus compared database entry is assigned a value of a confidence measure, which assesses the correspondence between the user input and this database entry. Different kinds of system responses which differ from one another in at least one feature are generated depending on the result of the confidence analysis, whereby a first kind of system response comprises, as a distinguishing first feature, a system output which requests a second user input, and a second kind of system response comprises, as a distinguishing second feature, the automatic selection of a database entry. The invention relates further to a corresponding apparatus, especially for carrying out this method, and to a vehicle having such an apparatus.

**[0004]** 2. Description of the Background Art

**[0005]** Generic user interfaces have a broad range of applications for the operation of devices, particularly electronic equipment. Particularly, the comparison of user inputs with database entries stored in a database are known from the technical field of search engines, in which a user input is compared with database entries and the relevance of each database entry is calculated by means of an algorithm and an associated confidence measure is output, which quantifies the relevance. If such a search result is unambiguous, the corresponding database entry is output or a function is carried out on its basis. If the search result is not unambiguous, in this case either typically a hit list or a system-side query is output. In this regard, the user input and system output form a dialog-like scheme, particularly when a system output responding to a user input asks for another user input.

**[0006]** Such user interfaces are used in particular when it is assumed that detected data are faulty either because of incomplete or ambiguous inputs on the part of the user or because of system-side imprecise detection, as is the case, for example, in speech input in a noisy environment or in manual inputs in an environment affected by vibrations. For this reason, such interactive user interfaces are used increasingly in vehicles in order to improve the operating convenience of the numerous operating devices, such as, for example, a navigation system, telecommunication devices, or infotainment systems.

**[0007]** Further, it must be taken into account in the case of a vehicle that the driver is not distracted from the road traffic during an operating procedure via the user interface. It was proposed for this reason to make possible a multimodal user input, whereby one can switch among the possible input modalities to the one most advantageous for the user. Common input modalities include in particular inputs via speech, which during a multi-part user input a switch can be made between two input modalities during the input as well.

**[0008]** DE 103 13 222 A1, which corresponds to U.S. Pat. No. 7,809,501, discloses a method for inputting place names in which ambiguous place names are shown in a graphic, for example, in the corresponding geographic positions on a map. The user then has the opportunity to make a rapid and unerring selection of the desired place name with the aid of this information.

**[0009]** DE 100 60 654 C1, which corresponds to U.S. Pat. No. 7,167,545, describes a method and a device for automatically issuing information by means of a search engine, in which the sought information, together with other associated attributes, are stored in the form of data records. A relevance check is performed with the stored database entries for a search argument input by the user for several attributes stored in a data record and via a weighting with confidence values the data record with the highest total confidence value is output. In the case of several data records with a nearly equal confidence value, the user is asked for further user input on the data record until the sought data record was clearly identified.

## SUMMARY OF THE INVENTION

**[0010]** It is therefore an object of the present invention to provide a method and a corresponding apparatus for operating a user interface with system responses of a first and second kind with distinguishing first and second features of the aforementioned type, which have an improved dialog efficiency. In particular, the dialog duration and/or the number of user interactions are to be reduced.

**[0011]** In an embodiment, the method can include a third kind of system response having the first and second feature, i.e., the features of the first and second kind of system responses, whereby the third kind of system response automatically changes into the first or second kind of system response after the elapse of a period of time. System responses of a third kind with both features of the first and second kind have the advantage that in the case of an ambiguous result of the confidence analysis both action options of the first and second type can be provided to the user. In this case, one of the two kinds recognizable to the user can be set as the standard or "default" to which the automatic change then takes place after elapse of the period of time without further user interaction. The user can thus realize whether in the case of an in fact ambiguous or incomplete input on his part the system has recognized the desired input. This is advantageous, when a further user input, be it only a confirmation of the system-side suggestion, threatens to distract the user from another activity, for example, during driving of a vehicle.

**[0012]** The change in the system response can occur depending on the result of the confidence analysis. In particular, the result of the confidence analysis decides whether a change occurs from the third kind of system response to the first kind of system response or to the second kind of system response. Alternatively or also in addition, the result of the confidence analysis for regulating the length of the time period or for configuring the change between the two kinds of system response can be included. For example, a change could contain a warning message that the system-side selection based on the result of the confidence analysis may be

DOCKET ALARM

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

**LAW FIRMS**
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

**FINANCIAL INSTITUTIONS**
Litigation and bankruptcy checks for companies and debtors.

**E-DISCOVERY AND LEGAL VENDORS**
Sync your system to PACER to automate legal marketing.