

# **METHOD FOR INVOKING LOCAL KEYBOARD ON HTML PAGE IN USER TERMINAL DEVICE AND APPARATUS THEREOF**

## **Technical Field**

The present invention relates to the field of communications, and in particular to a technology for invoking a local keyboard on a Hyper Text Markup Language (HTML) page in a user terminal device.

## **Background**

In a process of inputting information to a web page, some information needs to be inputted using a special keyboard to ensure the security or improve the input efficiency, for example, an input of some account passwords or online bank passwords, an input of an identity card number, or the like. However, some existing user terminals cannot invoke a portion of system built-in keyboards and customized keyboards on an HTML page due to respective systems limits. For example, a mobile terminal using an iOS system cannot invoke a local customized keyboard and a portion of keyboards built in the mobile terminal on an HTML5 page.

## **Summary**

An objective of the present invention is to provide a method for invoking a local keyboard on an HTML page in a user terminal device and an apparatus thereof, to solve the problem of failing to invoking a system built-in keyboard and a customized keyboard on an HTML page.

To solve the above technical problem, an implementation of the present invention

discloses a method for invoking a local keyboard on an HTML page in a user terminal device, which includes the following process:

analyzing an HTML page when the user terminal device loads the HTML page, and generating a local input field at each page input field having a recognition identifier if page input field(s) having recognition identifier(s) and needing to invoking local keyboard(s) exist(s), wherein the local input field covers a respective page input field at the same location;

setting a type of a respective local keyboard that needs to be invoked by each local input field; and

transmitting input information that is received by the local input field through a corresponding local keyboard to the HTML page.

An implementation of the present invention further discloses an apparatus for invoking a local keyboard on an HTML page in a user terminal device, which includes:

an analysis unit configured to analyze an HTML page when the user terminal device loads the HTML page, and determine whether page input field(s) having recognition identifier(s) and needing to invoking local keyboard(s) exist(s);

a generation unit configured to generate a local input field at each page input field having a recognition identifier when a determination result of the analysis unit is affirmative, wherein the local input field covers a respective page input field at the same location;

a setting unit configured to set a type of a respective local keyboard that needs to be invoked by each local input field; and

a transmission unit configured to transmit input information that is received by the local input field through a corresponding local keyboard to the HTML page.

Compared with existing technologies, the implementations of the present invention

mainly have the following differences and effects:

By adding a recognition identifier to an input field of an HTML page, a local input field may be generated at a page input field having a recognition identifier to cover the page input field when the page is loaded. As such, the local input field implements an invocation of a local keyboard that cannot be invoked by the page input field.

Furthermore, the local input field is configured as a transparent input field, and a design pattern of the page input field in the entire HTML page may be preserved after being used for covering the page input field.

Moreover, prompt information of the page input field is transferred to the local input field that covers the page input field, thus preventing the generation of a ghost image of the prompt information when the local input field is a transparent input field.

In addition, if a currently loaded page has a local input field that is left by a previous page, a situation, in which a local keyboard is invoked at a location where an input is not needed or a local keyboard covers a page input field of the currently loaded page is not needed, may occur when a user clicks on the current page. Therefore, a local input field that is left behind needs to be removed first to prevent the occurrence of this situation.

### **Brief Description of the Drawings**

FIG. 1 is a schematic flowchart of a method for invoking a local keyboard on an HTML page in a user terminal device according to a first implementation of the present invention.

FIG. 2 is a schematic flowchart of a method for preventing a local keyboard from obscuring a local input field according to the first implementation of the present invention.

FIG. 3 is a schematic structural diagram of an apparatus for invoking a local keyboard on an HTML page in a user terminal device according to a second embodiment of the present

invention.

## **Detailed Description**

A number of technical details are provided hereinafter to help readers understand the present application in a better manner. However, one of ordinary skill in the art can understand that technical solutions under the protection of the claims of the present application may also be implemented even without these technical details and various modifications and changes based on the following implementations.

The implementations of the present invention are described in further detail in conjunction with the accompanying drawings hereinafter to make the objectives, the technical solutions and the advantages of the present invention more clearly.

A first implementation of the present invention relates to a method for invoking a local keyboard on an HTML page in a user terminal device. FIG. 1 is a schematic flowchart of the method for invoking a local keyboard on an HTML page in a user terminal device.

As shown in FIG. 1, the method for invoking a local keyboard on an HTML page in a user terminal device includes the following process:

At step 101, a recognition identifier is added to an HTML page input field that needs to invoke a local keyboard. Local keyboards refer to keyboards that a user terminal possess, which includes a system built-in keyboard and a customized keyboard of the terminal. A customized keyboard refers to a keyboard that is not provided in a system of a terminal which is designed according to a specific demand, for example, a numeric keypad that is only used for inputting a monetary amount, a keyboard that is only used for inputting an identity card number, etc. A page input field refers to a label INPUT of the HTML. A recognition identifier refers to an identifier used for distinguishing from other input fields which do not

need to invoke a local keyboard, for example, adding a pattern category, an attribute, etc., to an INPUT label.

Step 102 is then performed. An HTML page is analyzed when the user terminal device loads the HTML page, and a determination is made as to whether page input field(s) having recognition identifier(s) and needing to invoke local keyboard(s) exist(s). The determination is made based on the recognition identifier that is added to the INPUT label at step 101.

If a determination result is affirmative, step 103 is performed. Otherwise, the process is ended.

At step 103, a respective local input field is generated at each page input field having a recognition identifier. A local input field covers a page input field at the same location.

Step 104 is then performed. A type of a respective local keyboard that needs to be invoked by each local input field is configured. Respective types of local keyboards that need to be invoked by different local input fields may be the same or different, which may depend on keyboard type identifiers added to the page input fields.

Step 105 is then performed. Input information which is received by the respective local input field through a corresponding local keyboard is transmitted to the HTML page.

The process is then ended.

In a preferred embodiment of the present invention, prior to step 105, the method further includes the following steps:

determining whether a local input field invoking a local keyboard will be blocked by the invoked local keyboard, in response to receiving a triggering event of invoking the local keyboard for display;

performing a response to a user input directly, and performing step 105 after the user input is completed if a determination result is negative; and

adjusting an offset of a scroll view of a webpage container of the user terminal device and a content height of the HTML page to enable the local input field invoking the local keyboard not to be blocked by the local keyboard if the determination result is positive. Specifically, a view of a webpage container of the user terminal device may be scrolled so that the local input field invoking the local keyboard will not be blocked by the keyboard. When a webpage height is insufficient for scrolling to prevent the input field from being blocked, a content height of the HTML is increased, and the manner of increasing the height may include increasing the padding-bottom of a webpage body, or adding blank height place holder(s), etc.

In the above step, a distance of the scrolling that needs to be conducted and the HTML content height that needs to be increased may be determined based on a height of the local keyboard, a position of the bottom of the page input field relative to the user equipment webpage container, and a height of a screen. As shown in FIG. 2, the height of the local keyboard, the position of the bottom of the page input field relative to the user equipment webpage container and the height of the screen may be acquired first. A determination is then made as to whether a sum of the height of the local keyboard and the position of the bottom of the page input field relative to the user equipment webpage container is greater than the height of the screen. If a determination result is positive, the webpage content height is increased and the offset of the scroll view of the user equipment webpage container is changed. The increase in the webpage content height and the amount of the offset are a difference between a sum of the height of the keyboard and the position of the bottom of the page input field relative to the user equipment webpage container and the height of the screen. If the determination result is negative, no processing is performed.

Moreover, in another preferred embodiment of the present invention, prior to step 105,

the method further includes the following steps:

determining whether a content height of the current HTML page is an initial value in response to receiving a triggering event of hiding a local keyboard; and

restoring the content height of the current HTML page to the initial value, and triggering scrolling of the HTML page if a determination result is negative, and performing step 105 if the determination result is positive.

In the above two preferred embodiments, an execution order of the processing after receiving a display event of invoking a local keyboard and the processing after receiving a trigger event of hiding a local keyboard is not fixed. One processing may be conducted after another processing, or both processing may be conducted in parallel.

Moreover, in another preferred embodiment of the present invention, step 103 may include the following sub-steps:

calculating location information of each page input field having the recognition identifier determined in the current HTML page, and acquiring an input type of each page input field having the recognition identifier; and

generating the respective local input field at each page input field having the recognition identifier to cover the page input field at a corresponding location based on the location information and the input type, wherein the local input field is a transparent input field, and an input type of the local input field is identical to an input type of the page input field covered by the local input field.

It may be understood that a local input field is set as a transparent input field, such that a design pattern of a page input field in an entire HTML page may be preserved after the page input field is covered by the local input field.

Moreover, in another preferred embodiment of the present invention, step 103 further

includes the following sub-step:

adding prompt information included in a page input field having an input prompt into a local input field that covers the page input field, and removing the prompt information from the page input field.

It may be understood that transferring prompt information of a page input field into a local input field that covers the page input field can avoid generating a ghost image of the prompt information when the local input field is a transparent input field.

If a currently loaded HTML page includes a local input field that is left behind by a previous HTML page, a situation, in which a local keyboard is invoked out at a location where no input is needed or the local keyboard covers a page input field of the currently loaded HTML page, may occur when a user clicks on the current HTML page. Therefore, the local input field that is left behind needs to be removed in advance to avoid the occurrence of this situation. Therefore, in a preferred embodiment of the present invention, prior to step 102, the method further includes the following steps:

determining whether a webpage container of the current user terminal device includes a generated local input field;

removing the generated local input field if a determination result is positive; and

directly performing step 102 if the determination result is negative.

In another preferred embodiment of the present invention, the HTML page is an HTML5 page, and an iOS system runs in the user terminal device. Apparently, it can be understood that the method disclosed in the present invention may also be used to solve the problem if other versions of HTML pages or other operating systems of user terminal devices have the same problem.

By adding a recognition identifier to an input field of a HTML page, a local input field

may be generated at a page input field having a recognition identifier to cover the page input field when the page is loaded. As such, the local input field can implement an invocation of a local keyboard that cannot be invoked by the page input field.

The method implementations of the present invention can all be implemented in a form of software, hardware, firmware, or the like. Regardless of whether the present invention is implemented by means of software, hardware or firmware, an instruction code can be stored in any type of computer accessible storage device (e.g., permanent or modifiable, volatile or non-volatile, solid-state or non-solid-state, fixed or replaceable media, etc.). Similarly, the storage device may be, for example, a Programmable Array Logic ("PLA"), a Random Access Memory ("RAM"), a Programmable Read Only Memory ("PROM"), a Read-Only Memory ("ROM"), an Electrically Erasable Programmable ROM ("EEPROM"), a magnetic disk, an optical disc, a Digital Versatile Disc ("DVD"), etc.

A second implementation of the present invention relates to an apparatus for invoking a local keyboard on an HTML page in a user terminal device. FIG. 3 is a schematic structural diagram of the apparatus for invoking a local keyboard on an HTML page in a user terminal device.

As shown in FIG. 3, the apparatus for invoking a local keyboard on an HTML page in a user terminal device includes:

- an addition unit configured to add a recognition identifier on an HTML page input field that needs to invoke a local keyboard;

- an analysis unit configured to analyze an HTML page when a user terminal device loads the HTML page, and determine whether page input field(s) having recognition identifier(s) and needing to invoke local keyboard(s) exist(s);

- a generation unit configured to generate a local input field at each page input field

having a recognition identifier when a determination result of the analysis unit is positive, wherein the local input field covers the respective page input field at a same location;

a setting unit configured to set a type of a local keyboard that needs to be invoked by each local input field; and

a transmission unit configured to transmit input information received by the local input field through a corresponding local keyboard to the HTML page.

Moreover, in a preferred embodiment of the present invention, the apparatus further includes the following units:

a first determination unit configured to determine whether the local input field invoking the local keyboard will be blocked by the invoked local keyboard after a triggering event of displaying the local keyboard is received; and

an adjustment unit configured to adjust an offset of a scroll view of a webpage container of the user terminal device and a content height of the HTML page if a determination result of the first determination unit is positive, such that the local input field invoking the local keyboard will not be blocked by the local keyboard, where the scroll view of the webpage container of the user terminal device may be scrolled for a distance so that when a webpage height is insufficient for scrolling to make the input field visible, the content height of the HTML page is adjusted to prevent the local input field from being blocked by the invoked local keyboard;

a second determination unit configured to determine whether the content height of the HTML page is an initial value after a triggering event of hiding the local keyboard is received; and

a restoring unit configured to restore the content height of the HTML page to the initial value when a determination result of the second determination unit is negative, and trigger

scrolling of the HTML page.

Moreover, in another preferred embodiment of the present invention, the generation unit includes the following sub-units:

a location calculation sub-unit configured to calculate location information of each page input field having the recognition identifier determined in the current HTML page, and acquire an input type of each page input field having the recognition identifier;

an input field generation sub-unit configured to generate the local input field at each page input field having the recognition identifier to cover the page input field at a corresponding location based on the location information and the input type, wherein the local input field is a transparent input field, and an input type of the local input field is identical to an input type of the page input field covered by the local input field; and

a prompt removal sub-unit configured to add prompt information included in a page input field having an input prompt into a local input field that covers the page input field, and remove the prompt information from the page input field.

Moreover, in another preferred embodiment of the present invention, the apparatus further includes the following units:

a third determination unit configured to determine whether a generated local input field in a webpage container of the user terminal device exists before the analysis unit analyzes the HTML page loaded by the user terminal device;

a removal unit configured to remove the generated local input field when a determination result of the third determination unit is positive; and

an execution unit configured to control the generation unit to generate the local input field at each page input field having the recognition identifier when the determination result of the third determination unit is negative.

The first implementation is a method embodiment corresponding to the present implementation. The present implementation may be implemented in conjunction with the first implementation. Related technical details mentioned in the first implementation are still effective in the present implementation, and are repeatedly described herein to reduce redundancy. Correspondingly, related technical details mentioned in the present implementation are also applicable to the first implementation.

It should be noted that the units mentioned in the apparatus implementations of the present invention are logical units. Physically, a logical unit may be implemented by a physical unit, a portion of a physical unit, or a combination of a plurality of physical units. Physical implementations of these logical units per se are not the most important, but a combination of functions implemented by the logical units is the key to solve the technical problem raised in the present invention. In addition, in order to highlight the innovative parts of the present invention, each apparatus implementation of the present invention does not introduce units that are not closely related to the technical problem raised in the present invention. However, this does not indicate that the apparatus implementations do not include other units.

It should be noted that relational terms such as "first" and "second" in the claims and specification of the present patent application are only used to differentiate one entity or operation from another entity or operation, but do not require or imply any actual relationship or order between these entities or operations. Moreover, terms such as "include", "comprise", or any variants thereof are intended to cover a non-exclusive inclusion, such that a process, a method, a product, or a device that includes a series of elements includes not only such elements but also other elements not specified expressly, or may further include inherent elements of the process, the method, the product, or the

device. Without additional restrictions, an element limited by "include a/an..." does not exclude other same elements existing in the process, the method, the product, or the device that includes the element.

Although the present invention has been illustrated and described with reference to some preferred implementations of the present invention, one of ordinary skill in the art should understand that various modifications can be made to the present invention in forms and details without departing from the spirit and scope of the present invention.

## Claims

1. A method for invoking a local keyboard on an HTML page in a user terminal device, comprising:

analyzing an HTML page when a user terminal device loads the HTML page, and generating a local input field at each page input field having a recognition identifier if page input field(s) having recognition identifier(s) and needing to invoking local keyboard(s) exist(s), wherein the local input field covers a respective page input field at a same location;

setting a type of a respective local keyboard that needs to be invoked by each local input field; and

transmitting input information that is received by the local input field through a corresponding local keyboard to the HTML page.

2. The method for invoking the local keyboard on the HTML page in the user terminal device of claim 1, wherein before the step of transmitting input information that is received by the local input field through a corresponding local keyboard to the HTML page, the method further comprises the following steps:

determining whether the local input field invoking the local keyboard will be blocked by the invoked local keyboard after a triggering event of displaying the local keyboard is received; and

adjusting an offset of a scroll view of a webpage container of the user terminal device and a content height of the HTML page to enable the local input field invoking the local keyboard not to be blocked by the local keyboard, if a determination result is affirmative.

3. The method for invoking the local keyboard on the HTML page in the user terminal device of claim 2, wherein before the step of transmitting input information that is received by the local input field through a corresponding local keyboard to the HTML page, the method further comprises the following steps:

determining whether the content height of the HTML page is an initial value in response to receiving a triggering event of hiding the local keyboard; and

restoring the content height of the HTML page to the initial value if a determination result is negative.

4. The method for invoking the local keyboard on the HTML page in the user terminal device of claim 1, wherein the step of generating a local input field at each page input field having a recognition identifier comprises the following sub-steps:

calculating location information of each page input field having the recognition identifier determined in the current HTML page, and acquiring an input type of each page input field having the recognition identifier; and

generating the local input field at each page input field having the recognition identifier to cover the page input field at a corresponding location based on the location information and the input type, wherein the local input field is a transparent input field, and an input type of the local input field is identical to an input type of the page input field covered by the local input field.

5. The method for invoking the local keyboard on the HTML page in the user terminal device of claim 4, wherein the step of generating a local input field at each page input field having a recognition identifier comprises the following sub-step:

adding prompt information included in a page input field having an input prompt into a local input field covering the page input field, and removing the prompt information from the page input field.

6. The method for invoking the local keyboard on the HTML page in the user terminal device of any of claims 1 to 5, wherein before the step of analyzing an HTML page when a user terminal device loads the HTML page, the method further comprises the following steps:

determining whether a webpage container of the user terminal device includes a generated local input field;

removing the generated local input field if a determination result is positive; and

directly performing the step of generating the local input field at each page input field having the recognition identifier if the determination result is negative.

7. The method for invoking the local keyboard on the HTML page in the user terminal device of any of claims 1 to 5, wherein the HTML page is an HTML5 page, and the user terminal device runs an iOS system.

8. An apparatus for invoking a local keyboard on an HTML page in a user terminal device, comprising:

an analysis unit configured to analyze an HTML page when the user terminal device loads the HTML page, and determine whether page input field(s) having recognition identifier(s) and needing to invoking local keyboard(s) exist(s);

a generation unit configured to generate a local input field at each page input field

having a recognition identifier when a determination result of the analysis unit is affirmative, wherein the local input field covers a respective page input field at a same location;

a setting unit configured to set a type of a respective local keyboard that needs to be invoked by each local input field; and

a transmission unit configured to transmit input information that is received by the local input field through a corresponding local keyboard to the HTML page.

9. The apparatus for invoking the local keyboard on the HTML page in the user terminal device of claim 8, further comprising the following units:

a first determination unit configured to determine whether the local input field invoking the local keyboard will be blocked by the invoked local keyboard after a triggering event of displaying the local keyboard is received; and

an adjustment unit configured to adjust an offset of a scroll view of a webpage container of the user terminal device and a content height of the HTML page if a determination result of the first determination unit is positive to enable the local input field invoking the local keyboard not to be blocked by the local keyboard.

10. The apparatus for invoking the local keyboard on the HTML page in the user terminal device of claim 9, further comprising the following units:

a second determination unit configured to determine whether the content height of the HTML page is an initial value after a triggering event of hiding the local keyboard is received; and

a restoring unit configured to restore the content height of the HTML page to the initial value when a determination result of the second determination unit is negative.

11. The apparatus for invoking the local keyboard on the HTML page in the user terminal device of claim 8, wherein the generation unit comprises the following sub-units:

a location calculation sub-unit configured to calculate location information of each page input field having the recognition identifier determined in the current HTML page, and acquire an input type of each page input field having the recognition identifier; and

an input field generation sub-unit configured to generate the local input field at each page input field having the recognition identifier to cover the page input field at a corresponding location based on the location information and the input type, wherein the local input field is a transparent input field, and an input type of the local input field is identical to an input type of the page input field covered by the local input field.

12. The apparatus for invoking the local keyboard on the HTML page in the user terminal device of claim 11, wherein the generation unit comprises the following sub-unit:

a prompt removal sub-unit configured to add prompt information included in a page input field having an input prompt to a local input field covering the page input field, and remove the prompt information from the page input field.

13. The apparatus for invoking the local keyboard on the HTML page in the user terminal device of any of claims 8 to 12, further comprising the following units:

a third determination unit configured to determine whether a generated local input field in a webpage container of the user terminal device exists before the analysis unit analyzes the HTML page loaded by the user terminal device;

a removal unit configured to remove the generated local input field when a determination result of the third determination unit is positive; and

an execution unit configured to control the generation unit to generate the local input field at each page input field having the recognition identifier when the determination result of the third determination unit is negative.