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A Method and Apparatus for Determining Chinese Characters in accordance with User Input

Field of the invention

5 The present invention relates to the Chinese character input, and particularly to the method and apparatus for determining Chinese characters in accordance with user input.

Background of the invention

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At present, more and more people are using Chinese as their languages in living or at work. In order to satisfy the people's need for using Chinese, Chinese input method is developing towards diversity and convenience. The most commonly used
15 Chinese character input methods are Chinese Pinyin input method, stroke input method, five stroke and font input method, etc.

Wherein, since the Pinyin method needs the user to study the Pinyin of the character, and it is really difficult for those
20 Chinese and foreigners whose mandarin Chinese level is poor to fluently master Chinese Pinyin. In the practical use, it is frequent that the user cannot input the desired Chinese character due to the his/her unfamiliar with the Pinyin of the Chinese character.

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Five stroke and font input methods may have some advantages in terms of input speed, however, it requires the user to memorize complicated etymon, therefore it's difficult to learn.

30 By comparison, stroke input method is a more basic Chinese



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character input method, and it does not require the user to master Chinese character Pinyin or to memorize etymon, as long as the user is able to write the Chinese character correctly, he/she can carry out the Chinese character input, which is more visualized and vivid.

However, the existing stroke input methods all depend monotonously on the user input of the strokes of the Chinese character, and the speed of the convergence of the candidate Chinese characters, say the decrease of the candidate Chinese characters with the user's increased input, is very slow. Especially when a Chinese character has many strokes, the user has to input many strokes before the candidate Chinese character list becomes short enough, which enables the user to find the desired Chinese character more easily.

Take the Chinese character "汉" in the phrase "汉字" as an example, according to the writing order of Chinese characters, its ordinal strokes are "point(\), point(\), lift stroke (✓), horizontal and right-falling stroke (乚), right-falling stroke (㇏). And then, in the process that the user successively inputs the first three strokes, and all the Chinese characters with "彳" will appear in the candidate Chinese character list. Of course, the list can also comprises those Chinese characters without 彳, but satisfy the aforesaid stroke order. No obvious convergence of the candidate Chinese character list will appear, until the user inputs the fourth stroke.

Therefore, a new Chinese character stroke input method based on stroke is needed. With the aid of this new Chinese character input method, the user can easily find his/her desired Chinese character from the candidate list by inputting less information, thus saving his/her time.

Summary of the invention

Since the stroke-based input method has the above-mentioned problems, the present invention aims to provide people with a more convenient and efficient Chinese character input method. Wherein, according to the Chinese character determination method provided by the present invention, the Chinese character input system receives the structure information of the Chinese character inputted by the user, which denotes the structure of a Chinese character such as semi-surround structure, one-component structure, etc. And preferably, the Chinese character input system combines the inputted stroke information with the structure information, and then provides the user with candidate Chinese characters. More preferably, the stroke(s) of the Chinese character inputted by the user satisfies a predefined rule, such as, when the strokes of the Chinese character is more than four, the user shall input the first two and last two strokes thereof.

According to the first aspect of the invention, there is provided a method for determining an Chinese character in accordance with user input, characterized by comprising the step of: according to the key information of a Chinese character inputted by a user, providing said user with at least one candidate Chinese character in accordance with said key

information, wherein, said key information comprises the structure information of said Chinese character.

5 According to the second aspect of the invention, there is provided an input apparatus for inputting Chinese character, characterized by comprising an input panel, said input panel comprises at least one structure key for a user to input the structure information of a Chinese character.

10 The present invention enables the user to find the desired Chinese character from the candidate list with less input, thus saving the user's time and avoiding high code repeat rate. According to a preferred embodiment of the present invention, the input apparatus only uses five input keys and two function
15 keys to support the input of Chinese characters, which is suitable for portable devices being sensitive to volume and key coverage area.

Brief description of drawings

20 Other characters, objects and advantages of the present invention will become more apparent upon reading the detailed description of the non-limiting embodiments, with reference to the accompanying drawings. Wherein, similar reference numerals represent similar apparatus (modules) or step
25 characters.

Fig. 1 is a schematic view of the input apparatus for user to input Chinese character according to a preferred embodiment of the present invention;

Fig. 2 is a schematic view of a Chinese character input system
30 according to an embodiment of the present invention;

Fig. 3 is a flowchart of a method according to an embodiment of the present invention, wherein, the Chinese character is determined in accordance with the user input;

Fig. 4 illustrates the method for the user to determine a Chinese character with semi-surround structure according to the first embodiment of the present invention;

Fig. 5 illustrates the method for the user to determine a Chinese character with one-component structure according to the second embodiment of the present invention;

Fig. 6 illustrates the method for the user to determine a Chinese character with left-and-right structure according to the third embodiment of the present invention;

Fig. 7 illustrates the method flowchart to determine a Chinese character according to the user's input according to a detailed embodiment of the present invention;

Fig. 8 illustrates the index table corresponding to table 2.

Embodiment of the present invention

Before describing all the aspects of the present invention in details in conjunction with the device drawings and the flowchart, the description on the concepts appearing in the description is given as follows, for the ease of understanding.

Stroke is the basic element that constituting Chinese characters, wherein, according to the writing direction, strokes can be divided into five categories:

- 1) the strokes written from left to right: horizontal stroke , indicated as "一", including "lift stroke" ✓ "
- 2) the strokes written from top to bottom: vertical stroke,

indicated as " | ";

3) the strokes written from top-right to bottom-left:
left-falling stroke, indicated as ") ";

4) the strokes written from top-left to bottom-right: point ,
5 indicated as " \ ", including "right-falling stroke";

5) all strokes with turning(s): turning stroke, indicated as
"乙", including hook stroke.

And, Chinese character structures comprise the following five
10 categories:

(I) semi-surround structure, such as "病".

(II) left-and-right structure and left-center-right structure,
such as "林", "储".

(III) top-and-bottom structure and top-center-bottom
15 structure, such as "草", "冀".

(IV) all-surround structure, such as "国".

(V) one-component structure, such as "为", "由".

According to the above-mentioned definition on the Chinese
20 character basic information, in one embodiment of the present
invention, the input apparatus for user to input Chinese
character is shown in Fig. 1, wherein, the functions of each
key are depicted in Table 1:

25 Table 1: the table of the keys' functions

Keys	Functions
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 (100)	Input "left-falling" stroke/select semi-surround structure
 (101)	Input "horizontal" stroke(including "lifting" stroke)/ select left-and-right structure or left-center-right structure/input the direction information indicated "move towards right"
 (102)	Input "vertical" stroke/ select top-and-bottom structure or top-center-bottom structure
 (103)	Input point (including "right-falling stroke")/ select all-surround structure/ input the direction information indicated "move towards left"
 (104)	Input "turning" stroke(including "hook" stroke)/select one-component structure
 (105)	Finish input/choose Chinese character
 (106)	Delete error input

From Table 1, the structure key used for inputting the structure information indicating the semi-surround structure shares key 100  with the stroke key for inputting the "left-falling" stroke; the structure key for inputting the structure information indicating the left-and-right structure or left-center-right structure shares key 101  with the stroke key for inputting the "horizontal" stroke; the structure key for inputting the structure information indicating the top-and-bottom structure or top-center-bottom structure shares key 102  with the stroke key for inputting the

"vertical" stroke; the structure key for inputting the structure information indicating the all-surround structure shares key 103  with the stroke key for inputting the "point" stroke; the structure key for inputting the structure information indicating the one-component structure shares key 5 104  with the stroke key for inputting the "turning" stroke.

Furthermore, according to this preferred embodiment, after any 10 time that the user inputs the key information, he/she can interrupt the input of the key information via press the function key 105, and further use the direction key to move the cursor, when the cursor moves to the desired Chinese character which the user wants to input, the user then presses function 15 key 105 and select the Chinese character as the final input result.

According to this preferred embodiment, when the candidate Chinese characters appear in the form of single line, said keys 20 101 and 103 will function as the direction keys, i.e., when the user presses key 101 or 103, this is considered as he/she inputs direction indication information indicating "move towards left" or "move towards right".

25 When the candidate Chinese characters appear in the form of multiple lines, the keys 100 and 102 will function as direction keys, i.e., when the user presses key 100 or 102, this is considered as he/she inputs direction indication information

indicating "move upwards" or "move downwards".

Those skilled in the art can understand that, when the preferred input apparatus in Fig. 1 is applied, since each of the keys
5 100-104 is a structure key, and at the same time a stroke key or a direction key (keys 100-103). Therefore, referring to Fig. 2, it is necessary to preset the input rules for the user in the processing apparatus 11, such as: the structure information shall be input first, and then the stroke information,. Detailed
10 description in this regard will be given hereunder.

Those skilled in the art should also understand that, the input apparatus shown in Fig. 1 is a non-limiting embodiment of the input apparatus provided by the present invention. According
15 to another embodiment of the invention, all the keys of the input apparatus have simpler functions, such as, the input apparatus has multiple structure keys which are solely used for inputting structure information, multiple stroke keys which are solely used for inputting stroke information, and multiple direction
20 keys. Based on such configuration of the input apparatus, since each key only has one specific function, the processing apparatus 11 only needs to, based on prior art, identify which key the user has pressed so that the instruction it has received is then generated. Therefore, the processing apparatus 11 can
25 acknowledge exactly the information that the user inputs.

According to another embodiment of the present invention, the number of the structure key(s), stroke key(s) equipped on said input apparatus is respectively 1. The user presses one key in
30 a short predefined time, and can input different information

based on the different times of pressing the key. For example, pressing the structure key once, and no longer pressing it in the remained part of that predefined time, or pressing other key such as a function key to interrupt the input of the structure
5 information, will represent inputting the semi-surround structure, etc. The same is true with the stroke information.

The input apparatus shown in Fig. 1 is typically applied in the Chinese character input system 1 shown in Fig. 2. The Chinese
10 character input system 1 comprises: an input apparatus 10, a processing apparatus 11, a storing apparatus 12 and an output apparatus 13.

Wherein, the user uses the input apparatus 10 (as shown in Fig.
15 1) to input the key information of a Chinese character, comprising structure information, preferably comprising stroke information. After the processing apparatus 11 reads the input information used as the searching condition to search in the pre-stored Chinese character library in the storing
20 apparatus 12, so as to find one or more Chinese characters corresponding to the key information inputted by the user. Said one or more Chinese characters found are considered as the candidate Chinese characters and will be provided to the user via the output device 13. The output device 13 is for example
25 a display or a loudspeaker, without loss of generality, taking a displaying device as an example in the following description, which is referred to as display 13.

Afterwards, the user can view the candidate Chinese characters
30 via the display 13. If the input key information is less, for

example, only the structure information, then huge candidate Chinese characters will present as a longer list. Restricted by the screen size of the display 13, said list may need to be displayed in pages, i.e. if the (desired) Chinese character which the user wants to input is at the end of the list, the user has to keep paging up until he/she finds the desired Chinese character.

Therefore, the user can continue to input other key information of the Chinese character in order to shrink the length of the list, and select the desired Chinese character as the final input result at an appropriate time.

The detailed description will be made with respect to the embodiments of the present invention with reference to the detailed flowchart, suppose the user uses the input apparatus shown in Fig. 1.

Fig. 3 is a flow chart of the method for determining the Chinese character in accordance with the user input according to a detailed embodiment of the present invention. Fig. 4 is a schematic view of the method for determining the Chinese character "厅" in accordance with the user input. Wherein, all the key information that the user inputs is shown in the order from left to right.

Referring to Fig. 4 and in conjunction with Fig. 1, Fig. 2 and Fig. 3, the description of the first embodiment is given. Wherein, suppose the predefined sequence for inputting the key information is: inputting the structure information first, then

inputting the stroke information.

In step S10, the user first presses the key 100, so as to input the structure information of "厅" : semi-surround structure.

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After obtaining the structure information input by the user, in step S11, the Chinese character input system 1(hereinafter referred to as system for short) searches all Chinese character with semi-surround structure in the pre-stored Chinese character library, suppose the searching result is: 医、区、
10 匡、回、匹、匠、巨、匣、匣、匪、匿、原、雁、辰、厄、厅...

The searching result is provided to the user as the candidate Chinese characters in an identifiable form, such as, displayed
15 by the display, or played by a loudspeaker.

Then, in step S12, system 1 judges whether the predefined condition is satisfied, in the embodiment, when any of the following conditions is satisfied, system 1 obtains the judging
20 result that the predefined condition is satisfied:

Condition 1: interruption indication information inputted by said user for interrupting the input of key information of said Chinese character is received;

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Condition 2: said user has finished the input of all key information according to said predefined rule.

The explanations on the two conditions are given as follows:

30 Condition 1:

Typically, according to the input apparatus 10 shown in Fig. 1, user can use the function key 105 to positively interrupt the input process of the key information, after any time that the key information is inputted and the candidate Chinese character is provided, to trigger the input process to enter the process of selecting the final input result based on the candidate Chinese characters. Therefore, the direction function of the keys that have direction function are activated, when one of them is pressed, the Chinese character input system 1 considers that the user has inputted a direction indication information, other than a structure or stroke information.

When the input apparatus is insensitive to area, the input apparatus will be equipped with more keys with single function than that in Fig. 1. Under this circumstance, since a structure information key is only used to input structure information, a stroke information key is only used to input stroke information, a direction information key is only used to input direction information, after the candidate Chinese characters are shown, if the Chinese character input system 1 identifies that the user presses a direction key or other function key that denotes the user is going to select the input result, it will trigger the input process to enter the process of selecting the final input result based on the candidate Chinese characters.

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Condition 2:

According to the basic idea of the invention to utilize the structure information to carry out Chinese character input based on strokes, there are many options for the method for inputting stroke information of a Chinese character, for

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example:

Method 1: inputting all the strokes of a Chinese character according to the stroke order or other orders;

Method 2: inputting specific strokes of the Chinese character.

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Condition 2 mainly aims at Method 2, i.e., system 1 is preset to obey the following predefined rules when the user inputs a Chinese character:

10 Rule 1: inputting all the strokes of a Chinese character which has four or less strokes;

Rule 2a: inputting the first two strokes as well as the last two strokes of a Chinese character which has more than four
15 strokes;

Rule 2b: inputting the first one stroke as well as the last three strokes of a Chinese character which has more than four strokes;

20 Rule 2c: inputting the first three strokes as well as the last one stroke of a Chinese character which has more than four strokes.

Wherein, uniformly choose one of rule 2a, 2b and 2c as the rule
25 for inputting a Chinese character which has more than four strokes.

Therefore, according to any of the rules 1 to 2c, the total number of the strokes that the user input for a Chinese character is
30 no more than 4. Therefore, based on a counter within the system,

when the stroke information after the user inputs the structure information reaches 4, system 1 determines that condition 2 is satisfied, and triggers the process of final input result selection based on the candidate Chinese characters.

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Of course, since the user does not input the information on the total number of the strokes of a Chinese character, the system 1 will know nothing about that. Therefore, for the Chinese character that has less than four strokes, in the present example, system 1 can rely on condition 1 to trigger the successive input result selection process.

If “厅” appears in the front of the candidate Chinese character list, for example, “厅” appears on the first page of the list when the list is divided to appear in several pages, the user may easily find it and press the function key 105 shown in Fig. 1 to interrupt the input of key information. Therefore, the method enters step S13, wherein, system 1 makes use of the indication information inputted by the user through pressing various direction key, function key 105, etc, to determine the input result.

Reversely, corresponding to the situation shown in Fig.4 , since the user does not find “厅” in the displayed candidate Chinese characters, e.g. “厅” locates at the tail part of the candidate Chinese character list, or, the user wants to continue to input other key information aside from the structure information then focus on the concrete content of the candidate Chinese characters. Therefore, the user will not input the indication

information indicating the interruption of the input of the key information, furthermore, since the user has only inputted the structure information of the Chinese character and has not inputted any stroke information, i.e., the user has not finish
5 the key information input based on the predefined rules, then, in step S12 the following judging result will be obtained: the predefined condition is not satisfied.

Since the predefined condition is not satisfied, the method
10 returns to step S10, system 1 continues to receive the key information inputted by the user. Suppose the user continues to input the first stroke of "厅": "一"

Then re-executes step S11, since the first strokes of the
15 afore-mentioned candidate Chinese characters "医、区、匡、匚、匹、匠、巨、匣、匪、匿、原、雁、辰、厄、厅..." are all "一", the input of the first stroke does not make the candidate Chinese character list converge to a great extent, therefore, suppose the step S12 also obtains the judging result that the predefined
20 condition is not satisfied. Preferably, when re-executing step S11, system 1 can carry out a new round of the search on candidate Chinese character based on the candidate Chinese character list result from the last search, instead of depending on the pre-stored Chinese character library.

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Therefore, re-execute step S10, the user inputs the second stroke "丿" of "厅". Therefore, in step S11, after re-search, the previous candidate Chinese characters such as "医、区、匡、匚、匹、匠、巨、匣、匪、匿" are excluded from the candidate Chinese

characters list, because the second stroke of these characters are vertical and turning strokes which belong to "turning stroke" instead of "丿". Therefore, the updated candidate Chinese character list will be "原、雁、辰、厄、厅...". Wherein,
5 "厅" will probably appear on the first page of the candidate Chinese characters.

Meanwhile, the user can directly press the function key 105 to trigger the input result selection with the aid of function key,
10 or input other key information to make the candidate Chinese character further converged.

Suppose the user selection is shown as Fig. 4, that is, continue to input the key information of "厅". Therefore, re-executes
15 step S10, and receives the user input of "一".

In step S11, the candidate Chinese character list becomes "辰、厅..." .

20 Suppose the user still chooses the situation shown as Fig. 4, therefore, re-executes step S10, system 1 receives the "turning" stroke via pressing the key 104 according to Fig. 1. Based on the definition above, "turning" comprises "hook" inputted by the user.

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Based on the structure information, four items of stroke information, the candidate Chinese character finally becomes "厅..." .

Meanwhile, the predefined rule, inputting all the strokes of the Chinese character whose number of strokes equals to four, is considered to be satisfied, therefore, system 1 will determine the final input result based on the user's successive indication information. Concretely, in step S13, system 1 determines "厅" as the input result according to the instruction that "selecting a candidate Chinese character as the input result" inputted by pressing the function key 105 by the user.

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Fig. 5 illustrates the method for the user to determine a Chinese character "于" according to the second embodiment of the present invention. Wherein, the stroke information that the user inputs comprises all the strokes of "于". Still referring to Fig. 3 in conjunction with Fig. 5, the description on the second embodiment is given as below. Still suppose the input sequence for inputting the key information is "inputting the structure information first, then inputting the stroke information".

20 Firstly, in step S10, system 1 receives the structure information from the user. Wherein, referring to Fig. 1, the

user presses the key 104 "  ", which denotes that the structure of the Chinese character is one-component structure.

25 In step S11, system 1 searches all the Chinese character with one-component structure in the pre-stored Chinese character library, and provides them to the user as candidate Chinese characters, for example: "一、十、木、土、天、立、上、下、见、日、

月、山、水、牛、羊、于..."。

Then, in step S12, system 1 judges whether receives the indication information used to indicate interrupting the input of key information from the user, or the predefined rule is
5 satisfied. Wherein, since the stroke information has not been input, therefore, the predefined rule is not satisfied. Further, suppose the user does not find "于" in the displayed candidate Chinese characters, for example, "于" locates at the
10 tail part of the candidate Chinese character list, or, the user wants to continue to input other key information aside from the structure information before focusing on the concrete content of the candidate Chinese character. Therefore, step S12 has the following judging result: the predefined condition is not
15 satisfied.

Then, re-execute step S10, the system 1 receives the stroke information "一" inputted by the user, which is corresponding to the first stroke of "于".

20

Then in step S11, the candidate Chinese character list accordingly converges to "一、十、木、土、天、下、于..."。

Suppose as is shown in Fig. 5, the user selects to continue
25 instead of interrupting the process of inputting key information, since the input based on the predefined rule does not end, the judging result of step S12 is still: the predefined rule is not satisfied.

Then re-execute step S10 again, system 1 again receives the stroke information "一" from the user, which is the second stroke of "于".

- 5 Then in step S11, according to the received stroke information that represents the second stroke, the candidate Chinese character list updates to "天、于...". Here, maybe the candidate Chinese character list has converged to the extent that the user can easily find the target Chinese character so as to end the
10 input process of the key information.

Therefore, the user can press the function key 105 to interrupt the input of the key information, and can determine the input result with the aid of the function key 105 and various direction
15 keys. If the user presses key 105, then system 1 will determine that, in step S12, the predefined condition is satisfied, and enter step S13 to prepare for the determination of the input result according to the successive indication information inputted by the user.

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In this example, suppose the user continues to input instead of interrupting the process of inputting key information, therefore, the judging result in step S12 is still: the predefined rule is not satisfied.

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Re-execute step S10 again, wherein, system 1 receives the third stroke information for "于", the last key information, from the user. Of course, at that time system 1 does not know that it is the last item of key information, since if the user hopes

to enter a Chinese character with more strokes, then the third stroke should be one stroke based on a predefined rule. For example, when the predefined rule is inputting the first two strokes as well as the last two strokes of a Chinese character
5 which has more than four strokes, then it is the last but two stroke of the Chinese character.

After re-filtered in step S11, the candidate list converges to "于...", preferably, including all the Chinese characters with
10 one-component structure, the first stroke and second stroke of which are both "一" , and the third stroke of which is turning stroke and the total number of strokes thereof is less than four, and all those characters whose first stroke and second stroke are "一" , and last but two stroke is "turning" stroke, supposing
15 for any Chinese character with more than four strokes, the predefined rule is to input the first two strokes and last two strokes.

Therefore, the user has finished inputting all the key
20 information for " ", in order to interrupt the input process to carry out the input result selection, the user inputs the indication information that indicates interrupting the input of the key information. (for example, presses key 105).

25 Therefore, step S12 obtains the following judging result: the predefined rule is satisfied, preferably, system 1 filters the candidate Chinese character list again, and excludes those Chinese characters whose total number of strokes does not equal to three, therefore, the final candidate Chinese character list

obtained only comprises all the Chinese characters whose first stroke and second stroke are "一" , and last stroke is "turning" stroke.

- 5 Then, system 1 will determine the final input result according to the indication information inputted by the user.

Fig. 6 illustrates the method for determining the Chinese character " " according to the third embodiment of the present invention. Wherein, the stroke information that the user inputs
10 comprises the first two and last two strokes of "创". Still suppose the sequence for inputting the key information is "inputting the structure information first, and then inputting the stroke information".

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In step S10, the user presses the key 101 on the input apparatus 10 shown in Fig. 1, which denotes that the structure of the Chinese character is left-and-right or left-center-right structure.

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Then, in step S11, system 1 searches all the Chinese character with left-and-right or left-center-right structure in the pre-stored Chinese character library, and provides them to the user as the candidate Chinese characters, for example: "冲、
25 次、冰、计、订、认、讨、让、议、记、刘、仁、从、什、仆、仃、仇、仍、仅、们、仕、付、代、仙、仪、他、伙、传、仿、伟、休、伍、伏、创……".

Since the candidate Chinese character list is really long, the user will probably select to continue to input the key

At the time, since the input of the key information based on the predefined rule is finished, in step S12, an affirmative judging result will be obtained, i.e., the pre-determined condition is satisfied.

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Then, the method steps into step S13, wherein, system 1 determines the final input result according to the indication information that the user inputs successively.

10 According to an embodiment of the present invention, system 1 can execute step S11 after the user inputs more than one items of key information. For example, by preset, after the system 1 receives two items of key information, one for structure information, one for stroke information, it then carries out
15 the search on the candidate Chinese characters. In this situation, if the pre-determined condition is not satisfied in step S12, then the method will go back to step S10, system 1 continues to receive at least one key information of the Chinese character inputted by the user.

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According to another embodiment of the present invention, the key information that the user inputs do not necessarily follow the sequence of "inputting the structure information first, then inputting the stroke information". For the input apparatus
25 10 shown in Fig. 1, the input sequence of the key information can be preset as "inputting the stroke information first, then inputting the structure information" or "inputting the first part of the stroke information first, then inputting the structure information, then inputting the second part of the
30 stroke information", etc. Therefore, system 1 can accurately

identify the user input information. Those skilled in the art understand that, other input sequence or the combination of strokes should also fall into the protection scope of the present invention.

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Fig. 7 illustrates the flowchart of the method for determining a Chinese character based on the user's input according to an embodiment of the present invention. Wherein, based on the input apparatus 10 shown in Fig. 1, in step S20, the system 1 receives the structure information of the Chinese character inputted by the user, according to the structure information, the system determines which structure that the user denotes according the pre-stored correlation between the input information and the structure of the Chinese character. According to a detailed embodiment of the present invention, the structure belongs to any of the following items: one-component structure, left-and-right structure, top-and-bottom structure, semi-surround structure, all-surround structure.

20 Having determined the specific structure, in step S22, system 1 uses the structure information as the key word to search in the pre-stored Chinese character library, and displays one or several Chinese characters that satisfy the structure condition as the candidate Chinese characters on the display. Afterwards, 25 if the user finds his/her desired Chinese character according to the displayed candidate Chinese characters, he/she will input the indication information to indicate the end of the input, then the method enters the Chinese character selection mode in step S24', and the final input result will be determined 30 according to the information that the user inputs afterwards.

If the user does not input the indication information that indicates the end of input, the method enters step S24, wherein, the system receives the first stroke inputted by the user.
5 Afterwards, in step S25, according to the pre-stored mapping information, displaying the stroke inputted by the user, and enters step S26. In step S26, according to the structure information inputted in step S20 and the first stroke inputted in step S24, the candidate Chinese characters will be determined
10 and displayed.

Further, a process similar to S23 will be performed, i.e., judging whether the indication information that indicates the end of input has been received from the user. If the judging
15 result is affirmative, then enters the Chinese character selection mode shown in step S28', and the final input result will be determined according to the user's input afterwards.

If the user does not input the indication information that indicates the end of input, the method proceeds with step S28, wherein, the system receives the second stroke that the user
20 inputs, and so on.

Suppose that the method enters step S30, wherein the system
25 receives the last stroke that the user inputs, this is also the last stroke of the Chinese character according to the sequence for Chinese character writing. Taking the Chinese character "王" as an example, the last stroke of it is "horizontal stroke".

30 Afterwards, in step S31, the system judges what stroke the user

inputs, it can be any of the following items: horizontal stroke, vertical stroke, left-falling stroke, right-falling stroke, turning stroke. Then, in step S32, the system determines the candidate Chinese characters to be displayed according to the structure information and stroke information inputted by the user that the system collected.

If the strokes of the Chinese character is less than four, then the user will indicate to end the input of the stroke information by pressing "enter" key, to trigger the system enter the Chinese character selection mode shown in step S34', and the final input result will be determined according to the information that the user inputs afterwards.

If the strokes of the Chinese character is more than four, then the system judges that the process for the user to input strokes according to the predefined rule is ended, therefore, likewise, the system enters the Chinese character selection mode (shown in step S34), and determines the final input result according to the information that the user inputs afterwards.

The Chinese character determination method according to the present invention is well compatible to the existing Chinese character national standard character library, such as GB2312. In an embodiment of the present invention, according to the machine code table, sets the machine codes of the Chinese character key information (structure information, stroke information) shown in Table 2:

Table 2: the key information machine code table based on GB2312

Key parameter	machine code table
horizontal stroke	A140
vertical stroke	A141
left-falling stroke	A142
right-falling stroke	A143
turning stroke	A144
left-and-right structure	A240
top-and-bottom structure	A241
semi-surround structure	A242
all-surround structure	A243
one-component structure	A244

The index table corresponding to table 2 is shown in Fig. 8, the index table unit structure comprises key information, next level index address offset, match Chinese character address offset, the number of match Chinese characters, wherein, match Chinese characters are one or several Chinese characters that are chosen as the candidate Chinese characters that match the key information that the user input. Such as "A2 40 00 28 7A

08 06 0C", wherein, A2 40 represents the key information and concretely corresponds to the stroke information "horizontal stroke"; 00 28 is the next level index offset address; 7A 08 is the match Chinese character offset address; 06 0C is the
5 number of match Chinese characters. Wherein, the offset addresses all corresponds to the initial location of the index table.

Next, take the Chinese character "状" as an example to illustrate
10 the process to search and display the candidate Chinese characters in the index table in Fig. 8. Suppose that the structure information that the user inputs corresponds to left-and-right structure or left-center-right structure, the system will obtain the key information A2 40, and starts to
15 search from the initial location of the index table according to the key information, when a matched item is obtained, the next level index address 0028 is obtained as the initial address for the successive input for the match; then retrieves the Chinese character corresponding to the address 7A 08, i.e.,
20 displays all the Chinese characters with left-and-right structure or left-center-right structure in turn on the screen; at the same time obtains the number of match Chinese character 060C. Then, the user continues to input the first stroke "vertical stroke "of "状", the system accordingly obtains the
25 key information A1 41, then, starting from address 00 28 obtained last time, finds the matches, then obtains the next level index address 05 28, as the initial address of the successive input for match; retrieves the Chinese character corresponding to the address 7E 40, i.e., displays all the
30 Chinese character with left-and-right structure or

left-center-right structure and whose initial stroke is
"vertical stroke" on the screen; and at the same time obtains
the number of match Chinese characters is 01 A4. The successive
search process is similar, until the user finishes inputting
5 all the key information according to the predefined rules.

Although some embodiments of the invention have been disclosed
in the foregoing description, they are not for the purposes of
limiting the protection scope of the invention, it is understood
10 by those skilled in the art that various modifications of the
invention are made without departing from the scope and spirit
of the present invention which fall into the protection scope
of the invention.

What is claimed is:

1. A method for determining Chinese character in
5 accordance with user input, characterized by comprising the
step of:

according to the key information of a Chinese character
which the user inputs, providing said user with at least one
candidate Chinese character in accordance with said key
10 information, wherein said key information comprises the
structure information of said Chinese character.

2. The method according to claim 1, characterized in that,
said key information further comprises stroke information
of said Chinese character.

15 3. The method according to claim 1 or 2, characterized
by comprising the steps of:

a. receiving at least one item of key information of said
Chinese character inputted by said user;

b. searching for at least one Chinese character in
20 accordance with said key information, and providing said at
least one Chinese character as said candidate Chinese
characters to said user.

4. The method according to claim 3, characterized by,
after said step b, further comprising the steps of:

25 c. according to said received key information, judging

whether or not a predefined condition is satisfied;

d. if said predefined condition is satisfied,
determining one among said candidate Chinese characters as
an input result according to indication information input
5 by said user.

5. The method according to claim 4, characterized by
further comprising the step of:

e. if said predefined condition is not satisfied,
repeating said steps a, b, c till said predefined condition
10 is satisfied.

6. The method according to any one of claims 3 to 5,
characterized in that said step c comprises determining that
said predefined condition is satisfied, when at least one
of the following conditions is satisfied:

15 interruption indication information inputted by said
user for interrupting the input of key information of said
Chinese character is received;

when said user inputs said key information according to
a predefined rule, said user has finished the input of all
20 key information according to said predefined rule.

7. The method according to any one of claims 3 to 6,
characterized in that said predefined rule comprises at least
one of the following items:

inputting all the strokes of a Chinese character which
25 has four or less strokes;

inputting the first two strokes as well as the last two strokes of a Chinese character which has more than four strokes.

8. An input apparatus for inputting Chinese character,
5 characterized by comprising an input panel, said input panel comprises at least one structure key for a user to input the structure information of a Chinese character.

9. The input apparatus according to claim 8,
characterized in that said at least one structure key
10 comprises:

a first structure key, for user to input the structure information indicating a Chinese character with left-and-right or left-center-right structure;

a second structure key, for user to input the structure
15 information indicating a Chinese character with top-and-bottom or top-center-bottom structure;

a third structure key, for user to input the structure information indicating a Chinese character with all-surround structure;

20 a fourth structure key, for user to input the structure information indicating a Chinese character with semi-surround structure;

a fifth structure key, for user to input the structure information indicating a Chinese character with
25 one-component structure.

10. The input apparatus according to claim 8 or 9, characterized in that said input apparatus further comprises at least one stroke key, for said user to input the stroke information of a Chinese character.

5 11. The input apparatus according to claim 10, characterized in that said stroke key comprises:

 a first stroke key, for user to input a horizontal stroke;

 a second stroke key, for user to input a vertical stroke;

 a third stroke key, for user to input a left-falling
10 stroke;

 a fourth stroke key, for user to input a point stroke;

 a fifth stroke key, for user to input a turning stroke.

12. The input apparatus according to any one of claims
9 to 11, characterized in that said input panel further
15 comprises:

 a direction key, for said user to input direction
indication information.

13. A Chinese character input system, characterized by
comprising the input apparatus for inputting Chinese
20 character according to any one of claims 8 to 12.