

result of the additional selected character (“S”) from the previous reduced character set keyboard or previous second set of keys 205. Character “H” is predicted as the more likely key 205b in this example, and is therefore superimposed or simply located over the position of the last selected key “S” from the previous set of keys 205. This reduces the hand movement required by the user to select “H”, but also “T” if this was to be selected. This can be seen with a comparison of the locations of the “T” and “H” keys on the underlying QWERTY keyboard 204.

[0057] Note that whilst it is preferred to superimpose the “current” set of keys 205 over the initial set of keys 204, it is also possible to display only the current set of keys, or indeed to display all sets of keys (204, 205, 205b and so on). Should the user wish to enter a word not in the on-board dictionary, and hence one that will not be predicted, he may return to the initial keyboard, for example by touching the first touch sensitive region 202 away from the (current) second set of keys 205.

[0058] Referring again to FIG. 3 as well as FIG. 4, the method 300 for implementing the above described features is described in more detail. Where the number of predicted potential subsequent characters $N_{\text{pred-char}}$ is less than N_{max} as determined at step 319 (Y), a grouping for a second set of input character keys 205 corresponding to these potential subsequent characters is determined 323. The number of characters or keys 205 is reduced compared with the number of keys on the first or initial keyboard 204, and this allows one or a number of advantageous features to be implemented. For example the keys 205 of the second set can be enlarged compared with the first set of keys 204, making them easier to identify and select for the user.

[0059] Additionally or alternatively, the keys 205 can have a different spatial relationship with respect to each other in order to reduce the distance between the keys and hence the lateral movement across the first touch sensitive region 202 required by the users hand and/or stylus. Thus the keys can be grouped such that they are adjacent each other. The flexibility in the relative locations of these keys 205 also allows them to be grouped depending on their likelihood, so that for example the proximity of each key to the centre of the grouping is dependent on its predicted likelihood. Furthermore, by grouping the keys together, the users focus is only required in a smaller part of the first touch sensitive region 202 compared with not grouping these keys together as illustrated by the highlighted keys 204C of FIG. 2.

[0060] Once the key grouping has been determined, the location on the first touch sensitive region 202 of the last selected key from a previous keyboard or set of keys 204 or 205 is determined at step 325—for example this might be the location of key “U” from FIG. 2, key “S” from FIG. 4, or key “T” from FIG. 6. In step 327, the new or second set of keys 205 are then displayed on the first touch sensitive region 202 of the touch screen 200, such that they are centred over the location determined at step 325. This reduces user hand movement across the touch screen.

[0061] The electronic device 100 then awaits receipt of a user selection of a character or word at step 329, which corresponds to actuation of one of the second set of input character keys 205 or a word from the second touch sensitive region 203. However if the word that is desired to be entered is not in the dictionary stored in the static memory then the

desired word will not be displayed in region 203 and possibly the desired character will not be displayed as a member second set of input character keys 205. In this scenario, a user can simply touch an area of the region 202 away from the second set of input character keys 205 and the complete set first set of input character keys 204 is displayed and allows selection of all character. The method 300 then determines whether one of the second set of input character keys 205 or a word was selected or entered (step 331). If a word was selected (W), the method 300 returns to step 307 and the word is displayed in the display region 201 of the touch screen layout 200. The method 300 then returns to the first step 301 or terminates. If an input character key was determined (K) as the selected input, at step 331, the corresponding selected character, for example “S” from FIG. 4, is then displayed adjacent the previously selected character (“U”) on the display region 201 of the touch screen 200 at step 333. The method then returns to step 311 where a new group of words is predicted dependent on the newly selected character.

[0062] The reduced hand movement required utilising the above described method of entering characters is illustrated in FIG. 7 and FIG. 8. FIG. 7 shows the path of hand movement across the first touch sensitive region 202 using a standard QWERTY predictive text keyboard to input the word “customizing”. FIG. 8 shows the path of hand movement across the same touch screen region 202 using the above described method. The number of clicks will be the same for each input keyboard(s), however as can be seen, the hand movement is much reduced using the new method; and corresponds to a 400% improvement. This is because each key selected can be used as a seed key for the next keyboard to be displayed, such that the key associated with the most likely potential subsequent character is located over the last selected character, this sequence repeating for each iteration of the method 300 for entering a new character. If the most likely potential subsequent character is selected on each new set of keys 205, then there will be no need for the user’s hand or stylus to move across the screen—once the second set of keys 205 start being displayed. If one of the less likely potential subsequent character keys is selected which is not located in substantially the same screen location or coordinates as the last selected key, then this newly selected key will become the seed key (ie central location) for the next key grouping 205, which will then be centred over this seed key’s location.

[0063] The described embodiments are especially well suited to facilitate improved data entry in portable or other small screen devices such as mobile phones, smart phones, PDA’s, portable media devices and the like. However other types of devices may also benefit from the described methods and apparatus. The embodiments may be used for example for entering text into email or SMS messages, or phone number, address and name information into a phone book database. Various other data entry and command entry applications can also be envisioned.

[0064] In the foregoing specification, specific embodiments of the present invention have been described. However, one of ordinary skill in the art appreciates that various modifications and changes can be made without departing from the scope of the present invention as set forth in the claims below. Accordingly, the specification and figures are to be regarded in an illustrative rather than a restrictive