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**Aberg**

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(54) **PORTABLE COMMUNICATION APPARATUS HAVING A HIERARCHICAL MENU SYSTEM AND A DYNAMIC MENU**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

PCT IPER for PCT/SE00/00474/II making reference to Microsoft Outlook 98.

\* cited by examiner

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(30) **Foreign Application Priority Data**

(57) **ABSTRACT**

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(51) **Int. Cl.**  
**H04M 1/00** (2006.01)

A portable communication apparatus, such as a mobile telephone, has a display, a user-controlled input device, a memory, a controller, and a hierarchical menu system stored in the memory. The menu system has a plurality of menus, including top-level menus, sub-level menus, and a plurality of menu items under respective menus. The controller is arranged to present individual menus/menu items on the display, receive selection commands from a user through the user-controlled input device and in response perform functions related to the presented menus/menu items. The memory of the apparatus has a dynamic menu, the contents of which may be modified by the user. The dynamic menu is either a top-level menu or a sub-level menu in the hierarchical menu system.

(52) **U.S. Cl.** ..... **455/566**; 455/550.1; 455/575.1; 455/90.1; 715/825; 345/169; 345/684; 345/685; 345/689

(58) **Field of Classification Search** ..... 455/550, 455/566, 575, 90; 345/169, 684, 685, 688; 715/825

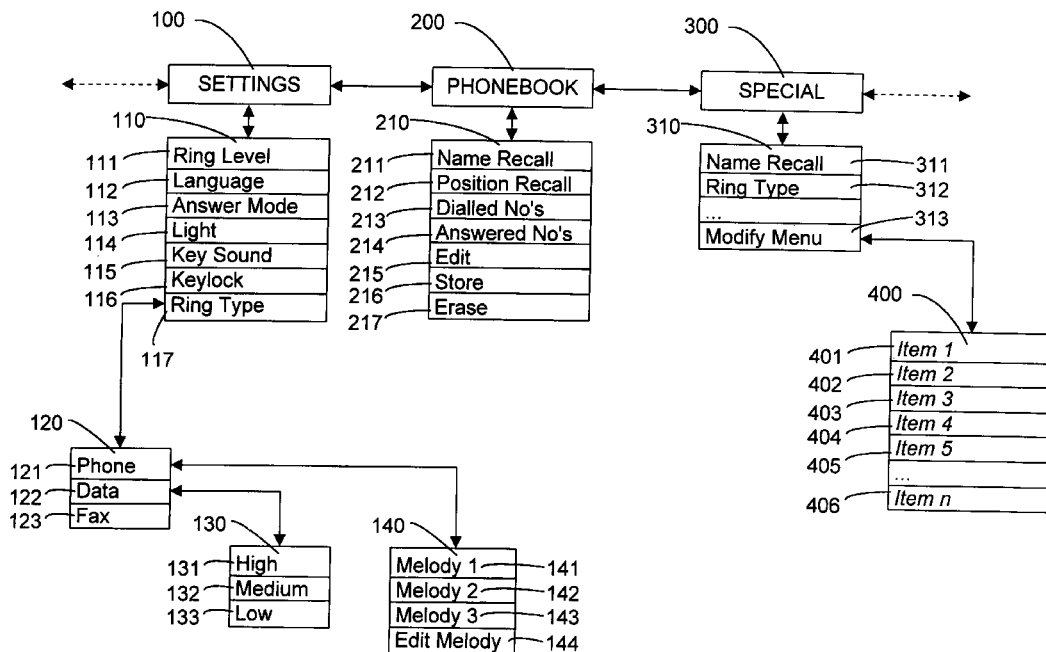
See application file for complete search history.

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**13 Claims, 2 Drawing Sheets**



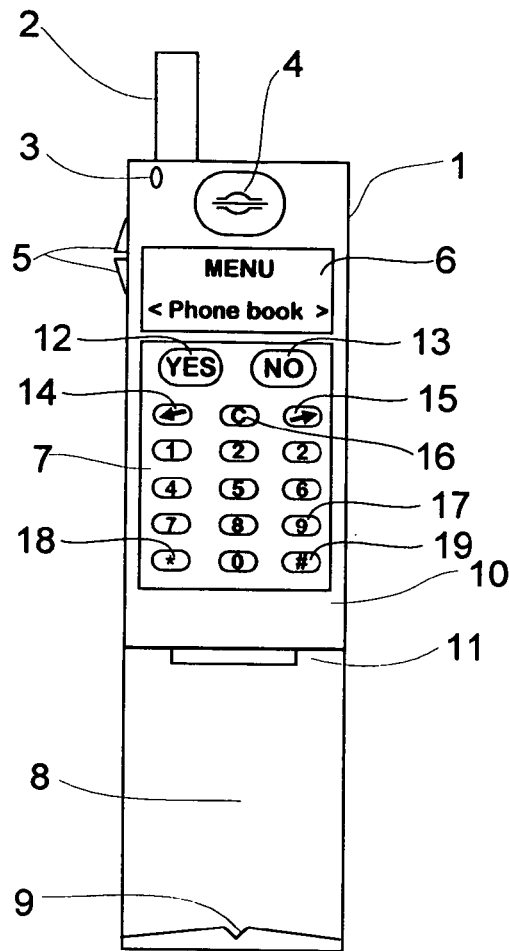


FIG 1

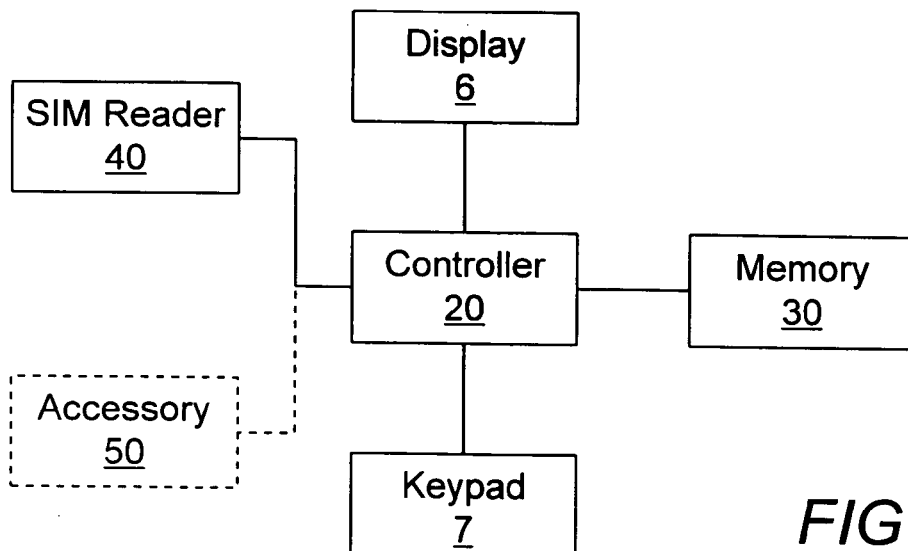


FIG 2

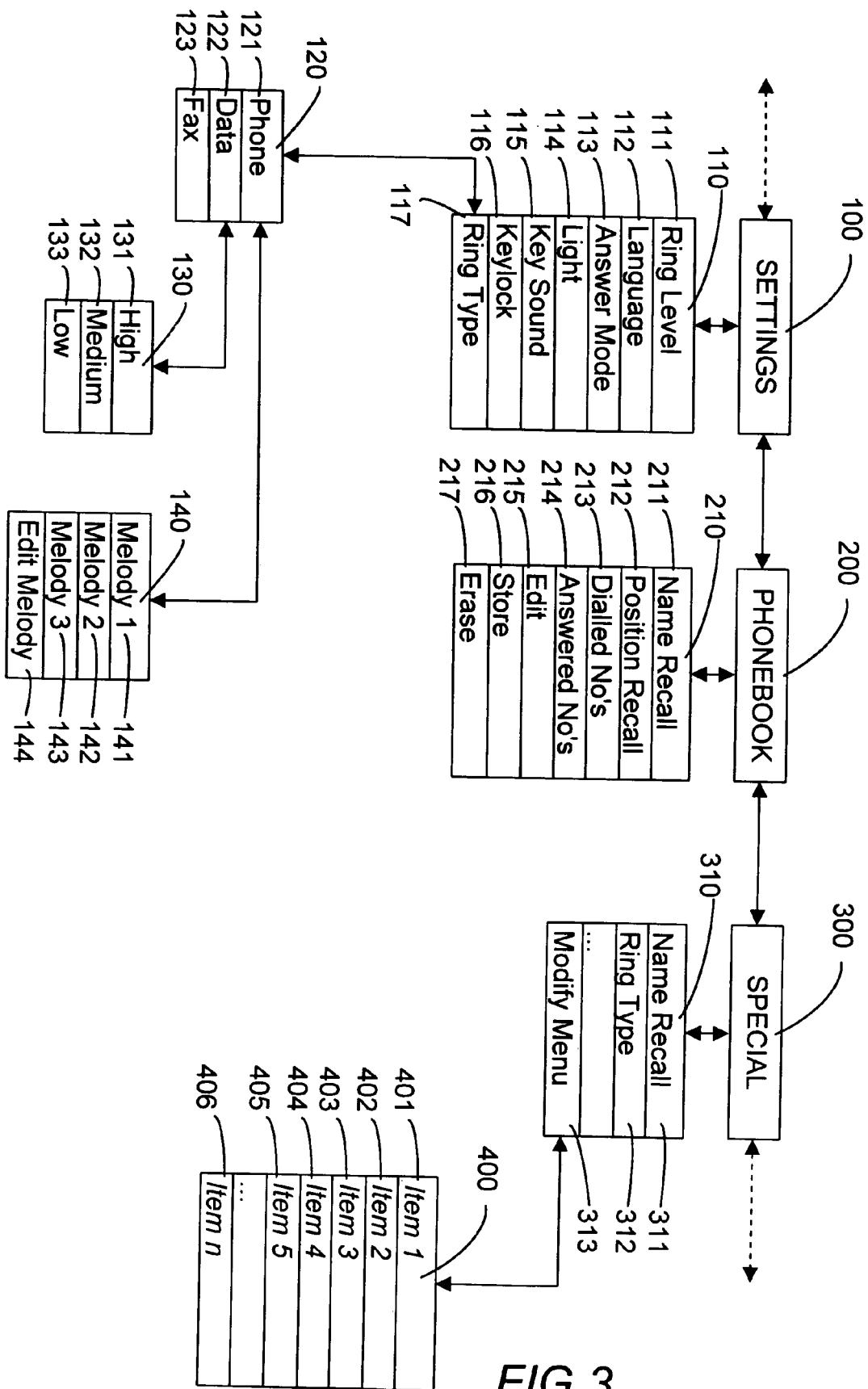


FIG. 3

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**PORTABLE COMMUNICATION APPARATUS  
HAVING A HIERARCHICAL MENU SYSTEM  
AND A DYNAMIC MENU**

**TECHNICAL FIELD**

The present invention relates to a portable communication apparatus, such as a mobile telephone, having a display, a user-controlled input device, such as a keypad, a memory, a controller and a hierarchical menu system stored in the memory. The menu system has a plurality of menus, including top-level menus and sub-level menus, and a plurality of menu items under respective menus. The controller is arranged to present individual menus or menu items on the display, is arranged to receive selection commands from a user through the user-controlled input device and is arranged to perform functions related to selected menus or menu items. The memory of the apparatus further comprises a dynamic menu, the contents of which may be modified by the user.

**BACKGROUND ART**

Mobile or cellular radio telephones are a well-known example of a portable communication apparatus according to the above. Other common examples are for instance personal communicators, personal digital assistants, paging devices, etc. Throughout this document, the present invention is illustrated in terms of a mobile telephone, in an exemplifying and non-limiting sense.

As mobile telephones have become more advanced and miniaturized, it has become increasingly important to provide an intuitive and yet precise interface to the user. The available man-machine interface in a mobile telephone is normally restricted to a display (such as an LCD display) and a keypad. Therefore, and it is an all but simple task to provide an adequate level of user-friendliness, particularly when bearing in mind that while modern mobile telephones are provided with more and more functions and features, the displays thereof have not been increased accordingly (mainly due to market demands for a limited overall apparatus size).

One well-known way of providing a user-friendly interface is to use a menu system as set out above. The various functions or features of the telephone are represented by different menus, sub-menus and menu items. The user navigates in the menu system by using certain control keys on the keypad for sequentially scrolling through the various menus. The user selects a certain menu or menu item by pressing a certain key or combination of keys on the keypad.

Although such menu systems are easy for users to utilize, they still have some disadvantages. For instance, if a large number of features are available, the user may have to scroll through several menus and menu items until arriving at the particular feature, that the user is looking for. Furthermore, not all users have identical needs and preferences; one user may prefer a certain menu structure, which may be less useful to another user. Therefore, it is difficult for the telephone manufacturer to design a menu structure, which fits all users.

The above drawback may be reduced by providing a short menu system and an extended menu system, where the contents of the short menu system is a subset of the extended menu system. Such a menu structure is disclosed in GB-A-2 293 951 (Motorola Inc.), where the user may choose, while

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short menu system, and where the user may delete individual menu items from the short menu, while scrolling through it. Hence, the short menu system is dynamic in the sense, that the user may customize the short menu system to include only such menu items, which are desired by the user.

The user enters the extended menu system by pressing a specific menu key on the keypad for a time greater than a predetermined time period. If, on the other hand, the menu key is pressed for a time shorter than the predetermined time period, the short menu system is entered. Both the extended menu system and the short menu system comprise various top-level menus (called "branches"), which in turn may comprise various sub-level menus and/or menu items for performing different functions in the mobile telephone.

While the approach shown in GB-A-2 293 951 has a distinct advantage in that it allows the user to customize the short menu system, some disadvantages still remain. For instance, the use of two different menu systems (extended and short, respectively) requires that the user have to learn the respective menu structure of both menus. Accordingly, the user will have to remember in which menu system a particular menu item is located, before entering the extended or short menu system. In reality, the user will probably use the short menu system in most cases, since the short menu system will enable the user to arrive at a desired menu item more quickly, as described above. However, the user will most likely not be able to remember exactly which menu items, that are currently included in the short menu system. Therefore, every once in a while, the user may find himself in a position, where he has entered the short menu system but looks for a menu item, which is only included in the extended menu system. In such a case, the user will have to exit the short menu system and then enter the extended menu system, as described above, and traverse the hierarchy of the extended menu system, until arriving at the desired menu item. Being left with a small keypad as the only available user input device, such a procedure may involve several or even numerous key pressings, until the desired menu item is eventually found.

A similar concept of customizing a short menu system has been used in recent mobile telephone models manufactured by the present applicant. Here, the extended menu system has a separate customization menu, one menu item of which is for entering a mode for customizing the short menu system, i.e. by adding/removing individual menu items of the extended menu system to/from the short menu system. A drawback of this approach is that, in order to customize the short menu system, the user has to enter the customization mode through aforesaid separate menu. Furthermore, the user still has to learn two separate menu structures.

**SUMMARY OF THE INVENTION**

It is an object of the present invention to provide an improved menu system for a portable communication apparatus, such as a mobile telephone. More particularly, the present invention aims at providing a dynamic menu, which may be customized by the user, which is easily accessible from the normal menu system ("extended menu system") and which also allows the user to add and delete menu items in an easy way.

The objects of the present invention have been obtained by providing the dynamic menu as either a toplevel menu or a sub-level menu within the normal menu system, meaning

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system) and that all previously added menu items are always accessible through the dynamic menu within the normal menu system.

According to a preferred embodiment of the present invention, the dynamic menu comprises a specific menu item, which provides a function for modifying the contents of the dynamic menu, e.g. by presenting a list of available menu items, from which the user may select certain items to be added to the dynamic menu. Also, the preferred embodiment comprises a similar function for removing menu items from the dynamic menu.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will now be described in more detail, reference being made to the accompanying drawings, in which:

FIG. 1 is a schematic front view of a portable communication apparatus, in the form of a mobile telephone, having a menu system according to the present invention,

FIG. 2 is a schematic block diagram of the communication apparatus in FIG. 1, and

FIG. 3 is a schematic diagram of a menu system according to the present invention, including a dynamic menu, which may be modified by a user of the communication apparatus.

Other objects, advantages and features of the present invention will appear from the following detailed disclosure, from the claims and from the drawings.

#### DETAILED DISCLOSURE OF THE INVENTION

FIG. 1 illustrates a mobile telephone 1 as one example of a portable communication apparatus according to the invention. The mobile telephone comprises an apparatus housing 10, to which a swingable flip 8 is pivotally mounted by means of a hinge mechanism 11. A sound opening 9 is provided at one end of the flip 8 for receiving vocal sound from a user of the telephone. A microphone (not shown in FIG. 1) is located inside the apparatus housing 10 adjacently to the hinge mechanism 11. An internal sound guiding channel is provided inside the flip 8 for guiding sound received through the opening 9 to the microphone.

The mobile telephone 1 further comprises an external antenna 2 mounted on the top of the apparatus housing 10, a visual status indicator 3 (such as an LED), and a speaker 4. Volume control buttons 5 are provided at one side of the housing 10. The mobile telephone further comprises a graphical display 6, such as an LCD display. As shown in FIG. 1, the user of the telephone may utilize a menu system presented on the display 6 for controlling and operating the mobile telephone.

The mobile telephone further has a keypad 7, comprising various keys such as a "YES" (OK) key 12 and a "NO" (cancel) key 13, menu scroll keys 14 and 15, a clear key 16, a total of ten (0 through 9) numeric keys 17, an asterisk key 18 and a square key 19.

Apart from the menu system, which will be described in more detail below, the above components of the mobile telephone are generally known per se and do not require any further explanation herein.

As shown in FIG. 2, the mobile telephone 1 comprises a controller 20, preferably a microprocessor (CPU), which is operatively connected to the display 6 and the keypad 7. The controller 20 is also connected to a memory 30, such as an EEPROM memory. In the context of the present invention,

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digital data of the mobile telephone 1, such as an operating system (OS), user settings parameters, utility programs (such as a calculator or various computer-type games), as is all readily understood by a man skilled in the art.

Furthermore, the controller 20 is operatively connected to a card reader 40 for accessing a SIM ("Subscriber Identity Module") card inserted in the mobile telephone. In some applications, the mobile telephone 1 may be connected to one or more than one accessory 50; in such a case, the controller 20 is also operatively connected to such an accessory, as indicated by a dashed line in FIG. 2.

In common with various known mobile telephones, for instance the one disclosed in GB-A-2 293 951, the mobile telephone 1 provides a user interface in the form of a menu system presented on the display 6. The menu system is stored in memory 30 and is executed by the controller 20, preferably by a dedicated menu program process run by the controller 20. Alternatively, the menu system may be built into the operating system of the mobile telephone 1. The user enters and uses the menu system by submitting commands from the keypad 7, as will be described in more detail below.

Parts of the menu system are shown in FIG. 3. The menu system comprises a plurality of top-level menus 100, 200, 300, a plurality of sub-level menus 110, 120, 130, 140, 210, 310, 400, and a plurality of menu items 111-116, 121-123, 131-133, 141-144, 211-217, 311-313 and 401-406. Some of the menu items are in fact subordinate sub-menus, which in turn may comprise further sub-menus and/or menu items. Thus, a hierarchical menu system is formed, which may be traversed by the user for controlling the functionality and features of the mobile telephone.

Three top-level menus are shown in FIG. 3: a SETTINGS menu 100, a PHONEBOOK menu 200 and a SPECIAL menu 300. The SPECIAL menu 300 is a dynamic menu, the contents of which may be modified by the user, as will be described below. Furthermore, the menu system comprises other top-level menus not shown in FIG. 3, such as a MAIL menu (e.g. for reading and sending short messages), a CLOCK menu (for setting date and time, setting an alarm, etc.), a CALCULATOR menu (for entering a special calculator mode, where the user may use the keys on the keypad 7 for performing numeric calculations), an ACCESS menu (for barring certain call types, locking the telephone or the SIM card, etc.), a NETWORKS menu (for selecting the mobile telecommunications network to be used by the telephone), etc. Other top-level menus may also be provided, which are generally well-known per se in the field of mobile telephones.

The user enters the menu system by pressing a particular key on the keypad 7. For instance, the menu system may be entered by pressing one of the scroll keys, 14, 15. Once the menu system has been entered, one of the top-level menus is presented on the display 6. In FIG. 1, the user is assumed to have pressed the left scroll key 14, wherein the PHONEBOOK menu 200 is shown on the display 6. If the user is looking for another top-level menu, he may continue to scroll through the menu system by means of the left scroll key 14 or the right scroll key 15, as indicated by bidirectional horizontal arrows in FIG. 3. Preferably, the chain of top-level menus is endless, so that pressing the right scroll key 15 after the last (rightmost) top-level menu will bring the user back to the first (leftmost) top-level menu. Conversely, pressing the left scroll key 14 at the first top-level menu will bring the user to the last (rightmost) top-level menu.

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