

A Method and Apparatus for Protecting Private Information on a User Apparatus

Field of the Invention

5 The invention relates to a method and apparatus for hiding one or more items on a user interface on a user apparatus. The invention further relates to a method for entering a new password or selecting a predetermined password on a user apparatus.

Background of the Invention

It is becoming more and more common to store items such as digital photographs, video files or music files on an electronic device (such as a personal digital entertainment (PDE) device) or a personal computer (PC). Some of the stored files or folders may be personal to the user and not for general viewing. Some users
15 would like to be able to mark certain files or folders as private if another user is using their device or to protect their private content if the device is lost or stolen. The ability to determine which files or folders can be viewed by another user would be advantageous.

Summary of the Invention

According to an aspect of the invention, there is provided an electronic device for storing electronic files, the electronic device comprising a user interface for displaying a plurality of electronic files, the electronic files being arranged:

25 a) to receive at least one instruction for at least one of the plurality of electronic files initially displayed on the user interface to be categorized as a hidden file;

b) to receive at least one instruction to hide the at least one of the plurality of electronic files which is categorized as a hidden file;

30 c) to hide the at least one of the plurality of electronic files which is categorized as a hidden file in a manner where the hidden file is not displayed on the user interface;

d) to receive at least one instruction for the hidden file to be displayed on the user interface; and

e) to display the hidden file on the user interface, wherein the at least one instruction for the hidden file to be displayed on the user interface includes selecting
5 an item from a listing of items displayed on the user interface, with data associated with the selected item serving as a password to allow transmission of the at least one instruction for the hidden file to be displayed on the user interface.

The apparatus is arranged so that a user can choose which of the plurality of items
10 initially displayed are to be subsequently hidden and which of the items are to be subsequently displayed. This is useful, for example, for privacy or if the apparatus is lost or stolen.

The apparatus may be arranged to request a password together with the instruction
15 to hide the one or more items to be hidden. This improves security.

The apparatus may be arranged to receive at least one of:

at least one instruction categorizing one or more items of the plurality of items initially displayed on the user interface as items to be hidden, the remaining items of
20 the plurality of items being categorized as items to be displayed; and

at least one instruction categorizing one or more items of the plurality of items initially displayed on the user interface as items to be displayed, the remaining items of the plurality of items being categorized as items to be hidden.

25 Thus, the user is able to select items to be hidden, the remaining items being automatically categorized as items to be displayed, or to select items to be displayed, the remaining items being automatically categorized as items to be hidden, or both.

30 The or each instruction receivable by the apparatus may be an instruction to categorize one item. That is, each instruction may relate to one item on the user interface.

In one embodiment, before the item(s) on the user interface categorized as files to be hidden are hidden, the item(s) on the user interface categorized as items to be hidden are displayed on the user interface with a marker. The marker shows a user which of the item(s) on the user interface are categorized as item(s) to be hidden.

In another embodiment, before the item(s) on the user interface categorized as items to be hidden are hidden, the item(s) on the user interface categorized as items to be displayed are displayed on the user interface with a marker. The marker shows a user which of the item(s) on the user interface are categorized as item(s) to be displayed.

Thus, the user can see which items are going to be displayed and which items are going to be hidden.

The apparatus may be further arranged to encrypt the item or items to be hidden.

The apparatus may be further arranged, after hiding, from the user interface, the one or more items to be hidden: to receive an instruction to display the one or more items to be hidden; and to display the one or more items to be hidden, such that the item or items categorized as items to be displayed and the item or items categorized as items to be hidden are displayed on the user interface. That is, the user can re-display all the items on the user interface. The apparatus may be arranged to request a password together with the instruction to display the one or more items to be hidden. This improves security.

The apparatus may be further arranged, after displaying the one or more items to be hidden: to receive at least one instruction, by which instruction or instructions, each item of the plurality of items is no longer categorized. That is, the items are no longer categorized either as items to be hidden or as items to be displayed.

In one embodiment, the apparatus is an electronic device for storing one or more electronic files, the plurality of items displayed on the user interface being at least some of the electronic files stored on the electronic device.

- 5 The electronic device preferably includes "UP", "DOWN", "LEFT", "RIGHT" and "SELECT" buttons. The electronic device may also include an "OPTIONS" button.

According to another aspect of the invention, there is also provided an electronic device for storing electronic files, the electronic device comprising a user interface
10 for displaying a plurality of electronic files, the electronic device being arranged:

- a) to receive at least one instruction for at least one of the plurality of electronic files initially displayed on the user interface to be categorized as a displayed file;
- b) to receive at least one instruction to hide the at least one of the plurality of
15 electronic files which is not categorized as a displayed file;
- c) to hide the at least one of the plurality of electronic files which is not categorized as a displayed file on the user interface;
- d) to receive at least one instruction for the hidden file to be displayed on the user interface; and
- 20 e) to display the hidden file on the user interface, wherein the at least one instruction for the hidden file to be displayed on the user interface includes selecting an item from a listing of items displayed on the user interface, with data associated with the selected item serving as a password to allow transmission of the at least one instruction for the hidden file to be displayed on the user interface.

25

The electronic files may be any types of electronic files, for example music files, picture files, photograph files or data files. The selected files may all be of the same category e.g. genre, date, size. The term "file" should also be taken to include folders containing one or more files. In one embodiment, the electronic device is a handheld
30 personal digital entertainment device. The user interface may be a screen on the personal digital entertainment device.

The electronic device may be arranged to request a password together with the instruction to hide the one or more files to be hidden. This improves security.

- 5 The password may comprise data associated with a music file stored on the electronic device. For example, the music file may be a song and the associated data may be the title of the song. In that case, the electronic device may be arranged to display a prompt to select a music file from the music files stored on the electronic device. Alternatively, the password may be a number. In that case,
10 the electronic device may be arranged to display a prompt to enter a number.

The electronic device may be arranged to receive at least one of:

- at least one instruction categorizing one or more files of the plurality of files initially displayed on the user interface as files to be hidden, the remaining
15 files of the plurality of files being categorized as files to be displayed; and

at least one instruction categorizing one or more files of the plurality of files initially displayed on the user interface as files to be displayed, the remaining files of the plurality of files being categorized as files to be hidden.

- 20 That is, the user may select the files to be hidden, whereby the other files are automatically selected as files to be displayed or the user may select the files to be displayed, whereby the other files are automatically selected as files to be hidden.

- 25 The or each instruction receivable by the electronic device may be an instruction to categorize one file. That is, each instruction may relate to one file on the user interface. In this case, if the user wishes to categorize several files, the corresponding number of instructions must be given.

- 30 In one embodiment, before the file(s) on the user interface categorized as files to be hidden are hidden from the user interface, the file(s) on the user interface

categorized as files to be hidden are displayed on the user interface with a marker. The marker shows a user which of the files on the user interface are categorized as files to be hidden.

- 5 In an alternative embodiment, before the file(s) on the user interface categorized as files to be hidden are hidden from the user interface, the file(s) on the user interface categorized as files to be displayed are displayed on the user interface with a marker. The marker shows a user which of the files are categorized as files to be displayed.

10

Thus, the user can easily see which files are going to be displayed and which files are going to be hidden.

15

The electronic device may be further arranged to encrypt the file or files to be hidden.

20

An instruction categorizing a file as a file to be hidden may comprise a user highlighting a file on the user interface using one or more of the "UP", "DOWN", "LEFT" and "RIGHT" buttons, showing a menu using the "OPTIONS" button and selecting "Mark as Private" in the menu using the "UP", "DOWN" and "SELECT" buttons.

25

An instruction categorizing a file as a file to be displayed may comprise a user highlighting a file using one or more of the "UP", "DOWN", "LEFT" and "RIGHT" buttons, showing a menu using the "OPTIONS" button and selecting "Mark as Selected" in the menu using the "UP", "DOWN" and "SELECT" buttons.

30

An instruction to hide, from the user interface, the one or more files to be hidden may comprise a user entering a "Settings" area on the user interface and selecting "Show Selected Folders Only" using the "SELECT" button.

The electronic device may be further arranged, after hiding the one or more files to be hidden from the user interface: to receive an instruction to display the one or more files to be hidden; and to display the one or more files to be hidden, such that the file or files categorized as files to be displayed and the file or files categorized as files to be hidden are displayed on the user interface. That is, the user can re-display all the files.

The instruction to display the one or more files to be hidden may comprise a user entering a "Settings" area on the user interface and selecting "Show All Folders" using the "SELECT" button.

The electronic device may be arranged to request a password together with the instruction to display the one or more files to be hidden. This improves security. The password may comprise data associated with a music file stored on the electronic device. For example, the music file may be a song and the associated data may be the title of the song. In that case, the electronic device may be arranged to display a prompt to select a music file from the music files stored on the electronic device. The user may then be able to select the music file functioning as the password. Alternatively, the password may be a number. In that case, the electronic device may be arranged to display a prompt to enter a number. The user may then be able to enter a number.

The electronic device may be further arranged, after displaying the one or more files to be hidden from the user interface: to receive at least one instruction, by which instruction or instructions, each file of the plurality of files is no longer categorized.

According to a further aspect of the invention, there is provided a method for hiding one or more items of a plurality of electronic files displayed on a user interface of an electronic device, the method including:

a) receiving at least one instruction for at least one of the plurality of electronic files initially displayed on the user interface to be categorized as a hidden file;

b) receiving at least one instruction to hide the at least one of the plurality of electronic files which is categorized as a hidden file;

5 c) hiding the at least one of the plurality of electronic files which is categorized as a hidden file in a manner where the hidden file is not displayed on the user interface;

d) receiving at least one instruction for the hidden file to be displayed on the user interface; and

10 e) displaying the hidden file on the user interface, wherein the at least one instruction for the hidden file to be displayed on the user interface includes selecting an item from a listing of items displayed on the user interface, with data associated with the selected item serving as a password to allow transmission of the at least one instruction for the hidden file to be displayed on the user interface.

15 By this method, a user can choose the items to be hidden and the items to be displayed and can, therefore, display only selected items on the user interface. This is useful, for example, for privacy or if the user apparatus is lost or stolen.

20 In one embodiment, step a) comprises the user apparatus receiving at least one instruction to categorize one or more items of the plurality of items as items to be hidden, the remaining items of the plurality of items being categorized as items to be displayed.

25 In that embodiment, the user can choose those item(s) which he would like to be hidden i.e. those items which are not to be displayed on the user interface. In one embodiment, those items are called private items. Automatically, those items which are not selected as private items are categorized as items to be displayed.

30 The or each instruction received by the user apparatus may be an instruction to categorize one item as an item to be hidden. That is, a single instruction may be associated with a single item.

After step a), the items categorized as items to be hidden may be displayed on the user interface with a marker. The marker indicates to a user which items are

marked as items to be hidden (i.e. which are private items) so that the user will know which items are going to be displayed and which items are not going to be displayed after step c).

- 5 In another embodiment, step a) comprises the user apparatus receiving at least one instruction to categorize one or more items of the plurality of items as items to be displayed, the remaining items of the plurality of items being categorized as items to be hidden.
- 10 In that embodiment, the user can choose those item(s) which he would like to be displayed. Automatically, those items which are not selected as items to be displayed are categorized as items to be hidden.

In one case, step a) comprises the user apparatus receiving only one instruction, by which instruction, one item is categorized as an item to be displayed and wherein, after step c), the user interface displays only that one item and does not display the remaining one or more items. This is useful in the case where the user wants to display only a single item from the plurality of items on the user interface.

- 15
- 20 In another case, step a) comprises the user apparatus receiving one or more instructions, the or each instruction received by the user apparatus being an instruction to categorize one item as an item to be displayed. That is, in this case, the user wants to display one or more items on the user interface and a single instruction is associated with a single item to be displayed.
- 25

After step a), the items categorized as items to be displayed may be displayed on the user interface with a marker. The marker indicates to a user which items are marked as items to be displayed (the other items being items to be hidden) so that the user will know which items are going to be displayed and which items are not going to be displayed after step c).

30

In one embodiment, step b) of the user apparatus receiving an instruction to hide, from the user interface, the one or more items to be hidden may comprise the user apparatus receiving a password. This improves security as only those users
5 who know the correct password are allowed to hide items from the user display.

The password may comprise data associated with a music file stored on the user apparatus. For example, music file may be a song and the associated data may be the title of the song. In that case, the user apparatus may provide a prompt to
10 select a song from the songs stored on the user means and the step of the user apparatus receiving a password may comprise a user selecting a song from the songs stored on the user apparatus. Alternatively, the password may be a number. In that case, the user apparatus may provide a prompt to enter a number and the step of the user apparatus receiving a password may comprise a
15 user entering a number.

Step c) may comprise the user apparatus encrypting the item or items to be hidden.

The method may further comprise, after step c), the steps of: d) the user
20 apparatus receiving an instruction to display the one or more items to be hidden; and e) the user apparatus displaying the one or more items to be hidden, wherein, after step e) the user interface displays the item or items categorized as items to be displayed and the item or items categorized as items to be hidden. Thus, the user can re-display all the items.

25 In this case, step c) may comprise the user apparatus encrypting the item or items to be hidden. In that case, step e) may comprise the user apparatus decrypting the encrypted item or items.

Step d) may comprise the user apparatus receiving a password. This improves security as only those users who know the correct password are allowed to re-display all the items, private and non-private, on the user interface.

- 5 As before, the password may comprise data associated with a music file stored on the user apparatus. Alternatively, the password may comprise a number.

The method may further comprise, after step e), the step of: f) the user apparatus receiving at least one instruction, by which instruction or instructions, each
10 item of the plurality of items is no longer categorized.

According to a further aspect of the invention, there is also provided a method for displaying one or more items of a plurality of electronic files displayed on a user interface of an electronic device, the method including:

- 15 a) receiving at least one instruction for at least one of the plurality of electronic files initially displayed on the user interface to be categorized as a displayed file;
b) receiving at least one instruction to hide the at least one of the plurality of electronic files which is not categorized as a displayed file;
c) hiding the at least one of the plurality of electronic files which is not categorized as
20 a displayed file on the user interface;
d) receiving at least one instruction for the hidden file to be displayed on the user interface; and
e) displaying the hidden file on the user interface, wherein the at least one instruction for the hidden file to be displayed on the user interface includes selecting
25 an item from a listing of items displayed on the user interface, with data associated with the selected item serving as a password to allow transmission of the at least one instruction for the hidden file to be displayed on the user interface.

The electronic files may be any types of electronic files, for example music files,
30 picture files, photograph files or data files. The term "file" should also be taken to include folders containing one or more files. In one embodiment, the electronic

device is a personal digital entertainment device. The user interface may be a screen on the personal digital entertainment device.

5 In a first embodiment, step a) comprises the electronic device receiving at least one instruction to categorize one or more files of the plurality of files as files to be hidden, the remaining files of the plurality of files being categorized as files to be displayed.

10 In this first embodiment, the user can choose those file(s) which he would like to be hidden i.e. those files which are not to be displayed on the electronic device's user interface. In one embodiment, those files are called private files. Automatically, those files which are not selected as private files are categorized as files to be displayed.

15 The or each instruction received by the electronic device may be an instruction to categorize one file as a file to be hidden. That is, a single instruction may be associated with a single file.

20 Step a) may comprise a user highlighting a file using the "UP", "DOWN", "LEFT" and "RIGHT" buttons, showing a menu using the "OPTIONS" button and selecting "Mark as Private" in the menu using the "UP", "DOWN" and "SELECT" buttons.

25 After step a), the files categorized as files to be hidden may be displayed on the user interface with a marker. The marker indicates to a user which files are marked as items files to be hidden (i.e. which are private files) so that the user will know which files are going to be displayed and which files are not going to be displayed after step c).

30 In a second embodiment, step a) comprises the electronic device receiving at least one instruction to categorize one or more files of the plurality of files as files

to be displayed, the remaining files of the plurality of files being categorized as files to be hidden.

5 In this second embodiment, the user can choose those file(s) which he would like to be displayed. Automatically, those files which are not selected as files to be displayed are categorized as files to be hidden.

10 In one case, step a) comprises the electronic device receiving only one instruction, by which instruction, one file is categorized as a file to be displayed and wherein, after step c), the user interface displays only that one file and does not display the remaining one or more files. This is useful in the case where the user wants to display only a single file from the plurality of files on the user interface.

15 In this case, the method may comprise a user highlighting that one file using the "UP", "DOWN", "LEFT" and "RIGHT" buttons, showing a menu using the "OPTIONS" button and selecting "Show this folder only" in the menu using the "UP", "DOWN" and "SELECT" buttons.

20 In another case, step a) comprises the electronic device receiving one or more instructions, the or each instruction received by the electronic device being an instruction to categorize one file as a file to be displayed. That is, in this case, the user wants to display one or more files on the user interface and a single instruction is associated with a single file to be displayed.

25 In this case, step a) may comprise a user highlighting a file using the "UP", "DOWN", "LEFT" and "RIGHT" buttons, showing a menu using the "OPTIONS" button and selecting "Mark as Selected" in the menu using the "UP", "DOWN" and "SELECT" buttons.

30

After step a), the files categorized as files to be displayed may be displayed on the user interface with a marker. The marker indicates to a user which files are marked as files to be displayed (the other files being files to be hidden) so that the user will know which files are going to be displayed and which files are not going to be displayed after step c).

In one embodiment, step b) of the electronic device receiving an instruction to hide the one or more files to be hidden comprises the electronic device receiving a password. This improves security as only those users who know the correct password are allowed to hide files from the user display.

The password may comprise data associated with a music file stored on the electronic device. For example, the music file may be a song and the associated data may be the title of the song. In that case, the electronic device may provide a prompt to select a song from the songs stored on the electronic device and the step of the electronic device receiving a password may comprise a user selecting a song from the songs stored on the electronic device. Alternatively, the password may be a number. In that case, the electronic device may provide a prompt to enter a number and the step of the electronic device receiving a password may comprise a user entering a number.

Step c) may comprise the electronic device encrypting the file or files to be hidden.

The method may further comprise, after step c), the steps of: d) the electronic device receiving an instruction to display the one or more files to be hidden; and e) the electronic device displaying the one or more files to be hidden, wherein, after step e) the user interface displays the file or files categorized as files to be displayed and the file or files categorized as files to be hidden. Thus, the user can re-display all the items.

In this case, step c) may comprise the electronic device encrypting the file or files to be hidden. In that case, step e) may comprise the electronic device decrypting the encrypted file or files.

- 5 Step d) may comprise the electronic device receiving a password. This improves security as only those users who know the correct password are allowed to re-display all the items, private and non-private, on the user interface.

As before, the password may comprise data associated with a music file stored
10 on the electronic device. For example, the music file may be a song and the associated data may be the title of the song. In that case, the electronic device may provide a prompt to select a song from the songs stored on the electronic device and the step of the electronic device receiving a password may comprise a user selecting a song from the songs stored on the electronic device.
15 Alternatively, the password may be a number. In that case, the electronic device may provide a prompt to enter a number and the step of the electronic device receiving a password may comprise a user entering a number.

The method may further comprise, after step e), the step of: f) the electronic
20 device receiving at least one instruction, by which instruction or instructions, each file of the plurality of files is no longer categorized.

Also disclosed herein is a method for selecting a new password or entering a predetermined password on a user apparatus for storing electronic files, the
25 method comprising the step of the user apparatus receiving an instruction selecting an item from a listing of items displayed on the user apparatus, data associated with the selected item serving as the password.

As is clear, the term "password" does not imply a word or phrase; in this case,
30 data associated with an item displayed on the user apparatus functions as the

password. The user need not know which data associated with the item is serving as the password but simply needs to know the item itself.

5 In one embodiment, the listing of items is a listing of electronic files stored on the device. In that case, the electronic files stored on the device may be electronic music files stored on the device. The data associated with the electronic music file may be any suitable data, for example the title of a song in the electronic music file. Thus, even if the electronic music file itself is deleted from the user apparatus, the password can still be remembered, since the associated data can
10 be retained even if the file itself is not.

The user apparatus is preferably an electronic device for example a personal digital entertainment device.

15 The electronic device may include "LEFT", "RIGHT", "UP", "DOWN" and "SELECT" buttons. In that case, the step of the user apparatus receiving an instruction selecting an item may comprise a user moving a highlighter to an item displayed on the user interface using one or more of the "UP", "DOWN", "LEFT" and "RIGHT" buttons and the user selecting the highlighted item using the
20 "SELECT" button. The electronic device may include an "OPTIONS" button.

Also disclosed herein is a method for selecting a new password or entering a predetermined password on a user apparatus for storing electronic files, the method comprising the step of the user apparatus receiving a number, the
25 number serving as the password.

As is clear, the term "password" does not imply a word or a phrase; in this case, a number acts as the password. The number may be any number of digits. In one preferred embodiment, the number is four digits long.

The step of the user apparatus receiving a number comprises a user entering a number between 0 and 9 at least once.

5 In a first embodiment, the or each step of entering a number between 0 and 9 comprises a user pressing a button on the user apparatus, each button corresponding to one of the numbers 0 to 9.

The user apparatus is preferably an electronic device for example a personal digital entertainment device.

10

The electronic device may include "LEFT", "RIGHT", "UP", "DOWN" and "SELECT" buttons. In that case, in the first embodiment, each of those buttons (and any other buttons on the electronic device) may correspond to a number between 0 and 9.

15

In a second embodiment, the user apparatus comprises "UP", "DOWN" and "SELECT" buttons and the or each step of entering a number between 0 and 9 comprises: a user scrolling through numbers 0 to 9 using the "UP" and "DOWN" buttons; and the user selecting a number between 0 to 9 using the "SELECT" button.

20

In this second embodiment, preferably as the user scrolls through the numbers, the numbers are displayed on a user interface on the user apparatus. Preferably, once the user has selected a number between 0 and 9 using the "SELECT" button, the user apparatus automatically allows the user to scroll through once again to select the next number between 0 and 9 if there is one.

25

Any features described in relation to one aspect of the invention may also be applicable to another aspect of the invention.

30

Brief Description of the Drawings

Exemplary embodiments of the invention will now be described with reference to the accompanying drawings, of which:

- 5 Figure 1 is a diagram of the process of marking and unmarking files as private, according to a first embodiment of the invention;
- Figure 2a is a view of a user interface showing private and non-private files;
- Figure 2b is a view of the user interface of Figure 2a with the private files hidden;
- 10 Figure 3 is a diagram of the process of showing only a single file, according to a second embodiment of the invention;
- Figure 4 is a diagram of the process of marking and unmarking files as selected, according to a third embodiment of the invention;
- Figure 5 is a view of a user interface showing password selection according to a first embodiment;
- 15 Figure 6 is a view of a user interface showing password selection according to a second embodiment; and
- Figure 7 is a view of a user interface showing password selection according to a third embodiment.

20

Detailed Description of Preferred Embodiments

Three levels of protection are provided. Protection Level One caters for users who just want casual protection of their private files or folders on their Personal Digital Entertainment (PDE) device. For example, a user may wish to show
 25 another user the non-private files or folders on his PDE device while he is present. No password protection is needed for Protection Level One.

Protection Level Two provides a higher level of protection. This level caters for users who may wish to lend their PDE device to another user for a small period
 30 of time. The user is not present when the second user is using the PDE device.

Password protection is available to prevent the second user from being able to look at the private files or folders.

However, for Protection Level Two, the password may be reset (for example if the user has forgotten the original password) or the password may be obtained, by connecting the PDE device to a PC having the appropriate software. Thus, it will be possible to view private files and folders if the device is connected to a PC having the appropriate software, so this level of protection is not fool-proof.

Protection Level Three provides the highest level of protection. The private files or folders cannot be viewed or the password obtained by anyone else, even if the PDE device is connected to a PC. This protects the private files or folders in the event that the PDE device is lost or stolen. For Protection Level Three, encryption and decryption of the files will need to be implemented in the device.

Figures 1, 2a and 2b show a first embodiment of the invention. In this embodiment, files and/or folders can be marked as private and the private files and/or folders can be shown or hidden.

Figure 1 shows the first stage for marking a non-private file or folder as private and for unmarking a private file or folder. Figure 1 shows the process in a PDE device which has "UP", "DOWN", "LEFT", "RIGHT", "ENTER" and "OPTIONS" buttons or portions of a single button. (The "ENTER" button may alternatively be a "OK" button or a "SELECT" button or another equivalent button.)

Figure 1 shows a user interface with an array of files, in this case photos. The user selects the photo to be marked private, using the "UP", "DOWN", "LEFT" and "RIGHT" buttons. This is shown in Figure 1a, where the top left photo is selected. Then the user presses the "OPTIONS" button. A menu appears and the user can use the "UP" and "DOWN" buttons to move to the option "Mark As Private". This is shown in Figure 1b. When the user presses the "ENTER"

button, the selected photo is marked with a private icon. This is shown in Figure 1c.

To unmark the photo as private, a similar process is carried out. The user
5 selects the private photo to be unmarked private, using the "UP", "DOWN",
"LEFT" and "RIGHT" buttons. Then, the user presses the "OPTIONS" button. A
menu appears and the user can use the "UP" and "DOWN" buttons to move to
the option "Unmark As Private". This is shown in Figure 1d. When the user
presses the "ENTER" button, the selected private photo is unmarked private and
10 the private icon is removed, as shown in Figure 1a.

Note that, when a private photo is selected and the user presses "OPTIONS",
"Unmark As Private" will automatically appear in the menu, whereas, when a
non-private photo is selected and the user presses "OPTIONS", "Mark As
15 Private" will automatically appear in the menu.

The marking and unmarking as private has been described with reference to a
PDE device that has an "OPTIONS" button. In general, for marking a file or
folder as private, a particular file or folder needs to be selected or highlighted
20 (e.g. by left-clicking it with a mouse), then the menu or display for that file or
folder needs to be shown (e.g. by right-clicking with a mouse or by selecting an
"options" function), then "Mark As Private" needs to be selected in the menu or
display (e.g. by left-clicking with a mouse or by using "UP", "DOWN" and
"ENTER" buttons). Similarly, for unmarking a private file or folder, a private file or
25 folder needs to be selected or highlighted (e.g. by left-clicking it with a mouse),
then the menu or display for that private file or folder needs to be shown (e.g. by
right-clicking with a mouse or by selecting an "options" function), then "Unmark
As Private" needs to be selected in the menu or display (e.g. by left-clicking with
a mouse or by using "UP", "DOWN" and "ENTER" buttons). Private files or
30 folders are marked with a private icon.

Once a user has marked one or more files or folders as private, the user may wish those files or folders to be shown or to be hidden.

To hide private files or folders the user goes to the "Settings" area of the PDE
5 device and selects "Private Content - Show" in the menu to toggle the status to
"Private Content - Hide". After hiding the private files or folders, the user can re-
show the private files or folders by going to the "Settings" area of the PDE device
again and selecting "Private Content - Hide" in the menu to toggle the status to
"Private Content - Show".

10

The above description for hiding and showing private files and folders relates to a
PDE device with a "Settings" area. In general, for hiding private files or folders, a
Settings menu needs to be selected and "Private Content - Show" or "Private
Content - Hide" as appropriate, needs to be selected.

15

Typically, the Settings area of the device will be located such that it is not
immediately obvious to a user who is unfamiliar with the device. This assists with
security as it means that another user cannot immediately show private files or
folders that were hidden or hide private files or folders that were shown.

20

Figure 2a shows a user interface with an array of files, in this case photos. In
Figure 2a, photos A, H, N and Q are marked private with a private icon.
However, the private photos are still shown. Figure 2b shows the user interface
of Figure 2a after the user has hidden the private photos. In Figure 2b, photos A,
25 H, N and Q are no longer displayed at all.

(It should be noted that the photos in Figures 2a and 2b are labeled with letters of
the alphabet only to assist with this description. Otherwise, it would be obvious
when looking at Figure 2b that photos A, H, N and Q are not displayed as the
30 photos do not run in sequence.)

It has already been mentioned that three levels of protection are envisaged. It will now be explained how those three levels of protection may be applied to the first embodiment of the invention described with reference to Figures 1, 2a and 2b.

5

Protection Level One provides only casual protection, to be used, for example, when a user is present when another user looks at the device. The user can mark certain files private and hide those private files when the second user uses the device. No further protection is required.

10

Protection Level Two provides a little more protection, to be used, for example, when a user lends his device to another user for a short period. If the user were simply to mark certain files private and hide those files, the second user would only need to find the "Settings" area of the device to be able to show and access
15 the private files. So password protection is also provided, as follows. When the user goes to the "Settings" area and selects "Private Content - Hide" to toggle the status to "Private Content - Show", a password is requested before the status can toggle. The password can be chosen earlier by the original user. Optionally, a password may also be requested, when the user selects "Private Content -
20 Show" to toggle the status to "Private Content - Hide". Although, it is obviously not as important that a password be required when a user is attempting to hide certain folders as when a user is attempting to show certain folders, it may none the less be advantageous. For example, if the second user hid certain folders, this may cause confusion for the original user or may cause errors if the user is
25 checking and updating his file collection. For Protection Level Two, password protection is provided, but the password can be obtained and the private files or folders shown or hidden simply by connecting the PDE device to a PC with the appropriate software. Thus, Protection Level Two is useful only when the second user does not have access to a PC with appropriate software.

30

Protection Level Three provides the highest level of protection. Just like Protection Level Two, password protection is provided but, in this case, the password cannot be obtained by connecting the device to a PC with the appropriate software. Thus, this is useful even when the second user has
 5 access to a PC with the appropriate software or to protect private content if the device is lost or stolen.

Passwords, for Protection Levels Two and Three, will be discussed further below.

10 A second embodiment of the invention will now be described with reference to Figure 3. In this embodiment, the user may choose to show only a single file or folder. All other files and folders will be hidden. A user will then only be able to view the non-private contents of the shown file or folder.

15 In a PDE device, having "UP", "DOWN", "LEFT", "RIGHT", "ENTER" and "OPTIONS" buttons, the process is as follows. The user selects the file or folder to be shown, using the "UP", "DOWN", "LEFT" and "RIGHT" buttons. This is shown in Figure 3a. Then the user presses the "OPTIONS" button. A display appears, as in the first embodiment, and the user can use the "UP" and "DOWN"
 20 buttons to move the option to "Show this Folder Only". This is shown in Figure 3b. When the user presses the "ENTER" button, only the selected file or folder is shown; all other files and folders are hidden. This is shown in Figure 3c. The user can only view the non-private content of the shown file or folder.

25 To show all the files and folders again, the user goes to the "Settings" area of the PDE device and selects "Show all Contents". All the files and folders will then be displayed.

The above description for hiding all except one file or folder relates to a PDE
 30 device with "UP", "DOWN", "LEFT", "RIGHT", "ENTER" and "OPTIONS" buttons. In general, for hiding all except one file or folder, a particular file or folder needs

to be selected or highlighted (e.g. by left-clicking it with a mouse), then the menu or display for that file or folder needs to be shown (e.g. by right-clicking with a mouse or by selecting an "options" function), then "Show this Folder Only" needs to be selected in the menu or display (e.g. by left-clicking with a mouse or by using
5 "UP", "DOWN" and "ENTER" buttons). Similarly, the above description for re-showing all the files and folders relates to a PDE device with a "Settings" area. In general, for re-showing all the files and folders, a settings menu needs to be selected and "Show all Contents" needs to be selected.

- 10 As before, typically the Settings area of the device will be located such that it is not immediately obvious to a user who is unfamiliar with the device.

The first and second embodiments are really just alternative ways to achieve the same effect. If a user wishes to only display a single file or folder, he can either
15 mark all the other files and folders as private and hide the private content (according to the first embodiment) or he can select the single file or folder and choose to show only that file or folder (according to the second embodiment). In the second embodiment, the other files or folders will not be marked as private and the second route is also considerably quicker than the first, particularly when
20 there are a large number of files and folders. Of course, with the second embodiment, only a single file or folder is displayed, whereas, with the first embodiment, any number of files or folders may be displayed.

It has already been mentioned that three levels of protection are envisaged. It
25 will now be explained how those three levels of protection may be applied to the second embodiment of the invention.

Protection Level One provides only casual protection, to be used, for example, when a user is present when another user is using the device. The user can
30 choose to show only one file or folder and hide the remaining files and folders when the second user is using the device. No further protection is required.

Protection Level Two provides a little more protection, to be used, for example, when a user lends his device to another user for a short period. As with the first embodiment, if the first user were simply to hide all the files and folders except one, the second user would only need to find the "Settings" area of the device to be able to show and access the remaining files and folders. So password protection is also provided, as follows. When the user goes to the "Settings" area and selects "Show all Contents", a password is requested before the remaining files and folders can be displayed. The password can be set earlier by a user.

10 Optionally, a password may also be requested when the user goes to the Options menu and selects "Show this Folder only". For Protection Level Two, password protection is provided, but the password can be obtained simply by connecting the PDE device to a PC with the appropriate software. Thus, Protection Level Two is useful only when the second user does not have access

15 to a PC with appropriate software.

Protection Level Three provides the highest level of protection. Just like Protection Level Two, password protection is provided (i.e. a password is requested when a user tries to re-show all un-displayed files or folders and,

20 optionally, when a user tries to display only a single file or folder, the remaining files and folders being hidden) but, for Protection Level Three, the password cannot be obtained by connecting the device to a PC with the appropriate software. Thus, this is useful even when the second user has access to a PC with the appropriate software or to protect private content if the device is lost or

25 stolen.

Passwords, for Protection Levels Two and Three, will be discussed further below.

A third embodiment of the invention will now be described with reference to

30 Figure 4. In this embodiment, the user may choose to show only selected files or folders. Other files and folders will be hidden. A user will then only be able to

view the non-private contents of the shown file(s) and/or folder(s). In this embodiment, there are two stages: firstly, the user selects certain files and/or folders; secondly, the user chooses to display only the selected files and folders.

5 In a PDE device having "UP", "DOWN", "LEFT", "RIGHT", "ENTER" and "OPTIONS" buttons, the process of the first stage is as follows. The user selects the file or folder to be marked, using the "UP", "DOWN", "LEFT" and "RIGHT" buttons. This is shown in Figure 4a. Then the user presses the "OPTIONS" button. A menu appears, as in the first and second embodiments, and the user
10 can use the "UP" and "DOWN" buttons to move the option to "Mark As Selected". This is shown in Figure 4b. When the user presses the "ENTER" button, the file or folder is marked with a check icon as shown in Figure 4c.

To unmark the file or folder as selected, a similar process is carried out. The
15 user selects the checked file or folder to be unmarked selected, using the "UP", "DOWN", "LEFT", and "RIGHT" buttons. Then the user presses the "OPTIONS" button. A menu appears and the user can use the "UP" and "DOWN" buttons to move to the option "Unmark As Selected". This is shown in Figure 4d. When the user presses the "ENTER" button, the selected checked file or folder is unmarked
20 selected and the check icon is removed as shown in Figure 4a.

Note that, when a checked file or folder is selected and the user presses "OPTIONS", "Unmark as Selected" will automatically appear in the menu, whereas, when a non-checked file or folder is selected and the user presses
25 "OPTIONS", "Mark As Selected" will automatically appear in the menu.

The marking and unmarking as selected has been described with reference to a PDE device that has an "OPTIONS" button. In general, for marking a file or folder as selected, a particular file or folder needs to be selected or highlighted
30 (e.g. by left-clicking it with a mouse), then the menu or display for that file or folder needs to be shown (e.g. by right-clicking it with a mouse or by selecting an

“options” function), then “Mark As Selected” needs to be selected in the menu or display (e.g. by left-clicking with a mouse or by using “UP”, “DOWN” and “ENTER” buttons). Similarly, for unmarking a checked file or folder, a checked file or folder needs to be selected or highlighted (e.g. by left-clicking it with a mouse), then the menu or display for that checked file or folder needs to be shown (e.g. by right-clicking with a mouse or by selecting an “options” function), then “Unmark as Selected” needs to be selected in the menu or display (e.g. by left-clicking with a mouse or by using “UP”, “DOWN” and “ENTER” buttons). Selected files or folders are marked with a check icon.

10

Once a user has selected one or more files and/or folders, the user may opt to show only the selected folders.

15

To hide non-selected files or folders, the user goes to the “Settings” area of the PDE device and selects “Show Selected Folders Only” in the menu. Then, only the selected folders are displayed and only non-private content in the selected folders can be viewed. After hiding the non-selected files or folders, the user can re-show those files or folders by going to the “Settings” area of the PDE device again and selecting “Show All Contents”.

20

25

The above description for hiding and showing non-selected files and folders relates to a PDE device with a “Settings” area. In general, for hiding non-selected files or folders, a settings menu needs to be selected and “Show Selected Folders Only” or “Show All Contents” as appropriate, needs to be selected.

As before, the Settings area of the device will be located such that it is not immediately obvious to a user who is unfamiliar with the device.

30

The first and third embodiments are really just alternative ways to achieve the same effect. If a user wishes to only display certain files or folders, he can either

mark all the other files and folders as private and hide the private content (according to the first embodiment) or he can mark the certain files or folders as selected and opt to show only the selected files or folders (according to the third embodiment). If he chooses to mark all files except one as private (first
5 embodiment) or to select only one file to be shown (third embodiment), this achieves the same effect as the second embodiment of the invention.

As before, three levels of protection are envisaged and it will now be explained how those three levels of protection may be applied to the third embodiment of
10 the invention.

Protection Level One provides only casual protection, to be used, for example, when a user is present when another user looks at the device. The user can select certain files which are allowed to be accessed by the second user, and
15 hide all the other files. No further protection is required.

Protection Level Two provides a little more protection, to be used, for example, when a user lends his PDE device to another user for a short period of time. As with the first and second embodiments, if the user were simply to hide certain
20 non-selected files or folders, the second user would only need to find the "Settings" area of the device to be able to show and access all the files. So password protection is also provided, as follows. When the user goes to the "Settings" area and selects "Show All Contents", a password is requested before all the files and folders can be displayed. The password can be set earlier by a
25 user. Optionally, a password may also be requested when the user tries to select "Show Selected Folders Only". Otherwise, the second user could potentially hide and password protect certain files so that the original user can no longer access all his files and folders. For Protection Level Two, password protection is provided, but the password can be obtained simply by connecting
30 the PDE device to a PC with the appropriate software. Thus, Protection Level

Two is useful only when the second user does not have access to a PC with appropriate software.

Protection Level Three provides the highest level of protection. Just like
5 Protection Level Two, password protection is provided but, in this case, the password cannot be obtained by connecting the device to a PC with the appropriate software. Thus, this is useful to protect private content, for example, if the device is lost or stolen.

10 Passwords, for Protection Levels Two and Three, will be discussed further below.

Three levels of protection have been described and a password is required for Protection Levels Two and Three. The invention provides several new methods for choosing a password. For all the embodiments to be described below, the
15 password can be set by a user as follows: the user goes to the "Settings" area of the device and selects "Set Password". If no password is already set, the user will be prompted to enter a new password (see embodiments below). If a password is already set, the user will be prompted to enter the existing password and then the user will be prompted to enter a new password (see embodiments
20 below).

According to a first embodiment, when the user is prompted to enter a new password, the user can choose a song stored in the device as the password. This is shown in Figure 5. The user is shown the list of songs and prompted to
25 pick one of those songs as the password. In actual fact, the device stores the name of the song rather than the song itself so that, if the song is deleted from the device, the device can still display the name of the song for selection as the password. In this embodiment, when a user is prompted to enter the password (for Protection Levels Two and Three), the user will be shown the list of songs
30 and asked to select the song. The user will only be allowed three attempts to

select a song, otherwise the device will only allow another selection five minutes later. This is to make password guessing tedious.

This embodiment is particularly useful when a large number of songs is stored in the device. This makes trying to guess the song acting as the password difficult.

In this embodiment, it is not actually necessary that the songs in the displayed list be stored on the device at all. For example, the device could simply display the top thousand most popular songs (none, some or all of which could be stored in the device) from which the user could select the password. Such an "artificial" list would be useful, for example, if there are not many songs actually stored in the device.

In fact, such an "artificial" list need not comprise a list of songs. It could be a list of any suitable items e.g. a list of albums, a list of animal types, a list of boys' names.

According to a second embodiment, when the user is prompted to enter a new password, the user can enter a series of up to four numbers like a numeric padlock. This is shown in Figure 6. The user selects each number using the "UP" and "DOWN" buttons to scroll through numbers 0 to 9. Once that number is selected, the user presses the "RIGHT" or "ENTER" button to move to the next number for selection. Once all numbers have been selected, the user presses "ENTER" or "OK" and the password is set. A similar process is used when a user is prompted to enter the password.

According to a third embodiment, the buttons on the device are each numbered, so that each button corresponds to a number. When the user is prompted to enter a new password, the user can enter a series of numbers using the buttons on the device. The user interface displays which buttons correspond to which numbers. This is shown in Figure 7. Any length password can be chosen. When

a user is prompted to enter the password (for Protection Levels Two and Three), the user can enter the appropriate password using the buttons on the device. The advantage of this embodiment is that the input is fast. However, the numbers are limited to the number of buttons on the device.

5

Alternatively, in the third embodiment, each button on the device can correspond to a character. In that case, when the user is prompted to enter a password, the user can enter a series of characters using the buttons on the device. As before, any length password can be chosen and the input is fast, but the number of possible characters is limited to the number of buttons on the device.

10

According to a fourth embodiment (not illustrated), when the user is prompted to enter a new password, the user can say a word into the device. The device will perform a voice recording, analyze the spoken word and store it as a voice password for comparison. This embodiment, of course, requires voice recognition technology in the device.

15

According to a fifth embodiment (not illustrated), when the user is prompted to enter a password, the user can enter a biometric input e.g. an iris or fingerprint scan. The device will store the biometric input for comparison.

20

In known arrangements, the user is asked to enter a password using alphanumeric characters. In a PDE device, however, this is slow and inefficient as PDE devices typically do not have a keyboard and selection of the words and letters has to be done on screen using "UP", "DOWN", "LEFT", "RIGHT" and "ENTER" buttons. This is time-consuming. All four embodiments described above significantly increase the speed of selecting and entering a password. They maximize use of the buttons on the PDE device.

25

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific

30

embodiments without departing from the scope of the invention as broadly described. The described embodiment are, therefore, to be considered in all respects illustrative and not restrictive.

CLAIMS

1. An electronic device for storing electronic files, the electronic device comprising a user interface for displaying a plurality of electronic files, the electronic files being arranged:

(a) to receive at least one instruction for at least one of the plurality of electronic files initially displayed on the user interface to be categorized as a hidden file;

(b) to receive at least one instruction to hide the at least one of the plurality of electronic files which is categorized as a hidden file;

(c) to hide the at least one of the plurality of electronic files which is categorized as a hidden file in a manner where the hidden file is not displayed on the user interface;

(d) to receive at least one instruction for the hidden file to be displayed on the user interface; and

(e) to display the hidden file on the user interface,

wherein the at least one instruction for the hidden file to be displayed on the user interface includes selecting an item from a listing of items displayed on the user interface, with data associated with the selected item serving as a password to allow transmission of the at least one instruction for the hidden file to be displayed on the user interface.

2. The electronic device of claim 1, wherein the listing of items is a listing of the electronic files stored on the electronic device.

3. The electronic device of claim 1, wherein the listing of items is a listing of random items.

4. The electronic device of claim 1, wherein selecting an item is restricted to three consecutive unsuccessful attempts after which the selection of an item is not allowable for a pre-determined duration of time.

5. An electronic device for storing electronic files, the electronic device comprising a user interface for displaying a plurality of electronic files, the

electronic files being arranged:

(a) to receive at least one instruction for at least one of the plurality of electronic files initially displayed on the user interface to be categorized as a displayed file;

(b) to receive at least one instruction to hide the at least one of the plurality of electronic files which is not categorized as a displayed file;

(c) to hide the at least one of the plurality of electronic files which is not categorized as a displayed file on the user interface;

(d) to receive at least one instruction for the hidden file to be displayed on the user interface; and

(e) to display the hidden file on the user interface,

wherein the at least one instruction for the hidden file to be displayed on the user interface includes selecting an item from a listing of items displayed on the user interface, with data associated with the selected item serving as a password to allow transmission of the at least one instruction for the hidden file to be displayed on the user interface.

6. The electronic device of claim 5, wherein the listing of items is a listing of the electronic files stored on the electronic device.

7. The electronic device of claim 5, wherein the listing of items is a listing of random items.

8. The electronic device of claim 5, wherein selecting an item is restricted to three consecutive unsuccessful attempts after which the selection of an item is not allowable for a pre-determined duration of time.

9. A method for hiding one or more items of a plurality of electronic files displayed on a user interface of an electronic device, the method including:

(a) receiving at least one instruction for at least one of the plurality of electronic files initially displayed on the user interface to be categorized as a hidden file;

(b) receiving at least one instruction to hide the at least one of the plurality of electronic files which is categorized as a hidden file;

(c) hiding the at least one of the plurality of electronic files which is categorized as a hidden file in a manner where the hidden file is not displayed on the user interface;

(d) receiving at least one instruction for the hidden file to be displayed on the user interface; and

(e) displaying the hidden file on the user interface,

wherein the at least one instruction for the hidden file to be displayed on the user interface includes selecting an item from a listing of items displayed on the user interface, with data associated with the selected item serving as a password to allow transmission of the at least one instruction for the hidden file to be displayed on the user interface.

10. The method of claim 9, wherein the listing of items is a listing of the electronic files stored on the electronic device.

11. The method of claim 9, wherein the listing of items is a listing of random items.

12. The method of claim 9, wherein selecting an item is restricted to three consecutive unsuccessful attempts after which the selection of an item is not allowable for a pre-determined duration of time.

13. A method for displaying one or more items of a plurality of electronic files displayed on a user interface of an electronic device, the method including:

(a) receiving at least one instruction for at least one of the plurality of electronic files initially displayed on the user interface to be categorized as a displayed file;

(b) receiving at least one instruction to hide the at least one of the plurality of electronic files which is not categorized as a displayed file;

(c) hiding the at least one of the plurality of electronic files which is not categorized as a displayed file on the user interface;

(d) receiving at least one instruction for the hidden file to be displayed on the user interface; and

(e) displaying the hidden file on the user interface,

wherein the at least one instruction for the hidden file to be displayed on the user interface includes selecting an item from a listing of items displayed on the user interface, with data associated with the selected item serving as a password to allow transmission of the at least one instruction for the hidden file to be displayed on the user interface.

14. The method of claim 13, wherein the listing of items is a listing of the electronic files stored on the electronic device.

15. The method of claim 13, wherein the listing of items is a listing of random items.

16. The method of claim 13, wherein selecting an item is restricted to three consecutive unsuccessful attempts after which the selection of an item is not allowable for a pre-determined duration of time.