

(21) Application No: **0814561.7**
(22) Date of Filing: **08.08.2008**
(30) Priority Data:
(31) **0715976** (32) **15.08.2007** (33) **GB**

(51) INT CL:
H04M 1/725 (2006.01)

(56) Documents Cited:
EP 1885109 A2 **EP 1355223 A2**
US 4504701 A **US 20070036348 A1**
US 20070004451 A1 **US 20020021278 A1**

(71) Applicant(s):
Giles Martin Wren-Hilton
28 Arwenack Avenue, FALMOUTH,
Cornwall, TR11 3JW, United Kingdom

(58) Field of Search:
Other: **WPI, EPODOC**

(72) Inventor(s):
Giles Martin Wren-Hilton

(74) Agent and/or Address for Service:
Giles Martin Wren-Hilton
28 Arwenack Avenue, FALMOUTH,
Cornwall, TR11 3JW, United Kingdom

(54) Abstract Title: **Apparatus and method for automatically changing the profile or mode of a mobile phone**

(57) A mobile phone 100 with primary display 101 has a processing unit 300 adapted to receive input from sensors 200, 201 and 202 and in consequence of receiving orientation and movement data from said sensors to automatically change the profile or mode of the device. The sensors may comprise one or more of a gravity operated switch sensor, light sensor and dual axis or tri-axis accelerometer sensor. The phone may detect when it is face down and mute audible alert signals or activate call diversion to a different telephone number, voice mail or similar messaging system.

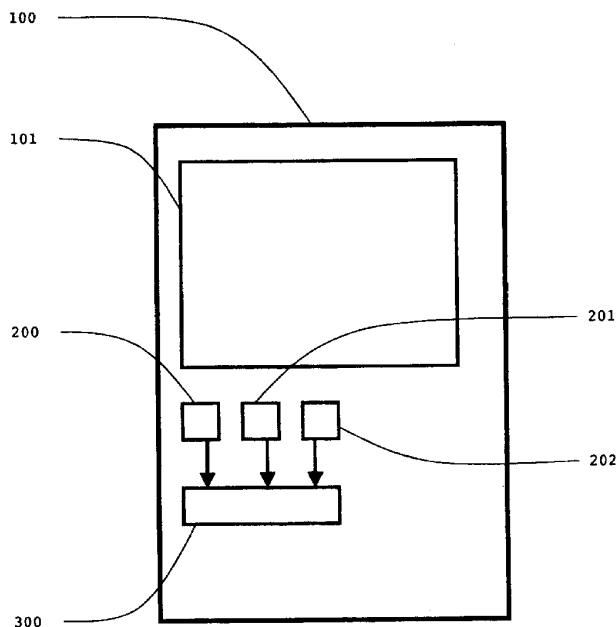


Figure 1

GB 2 451 943 A

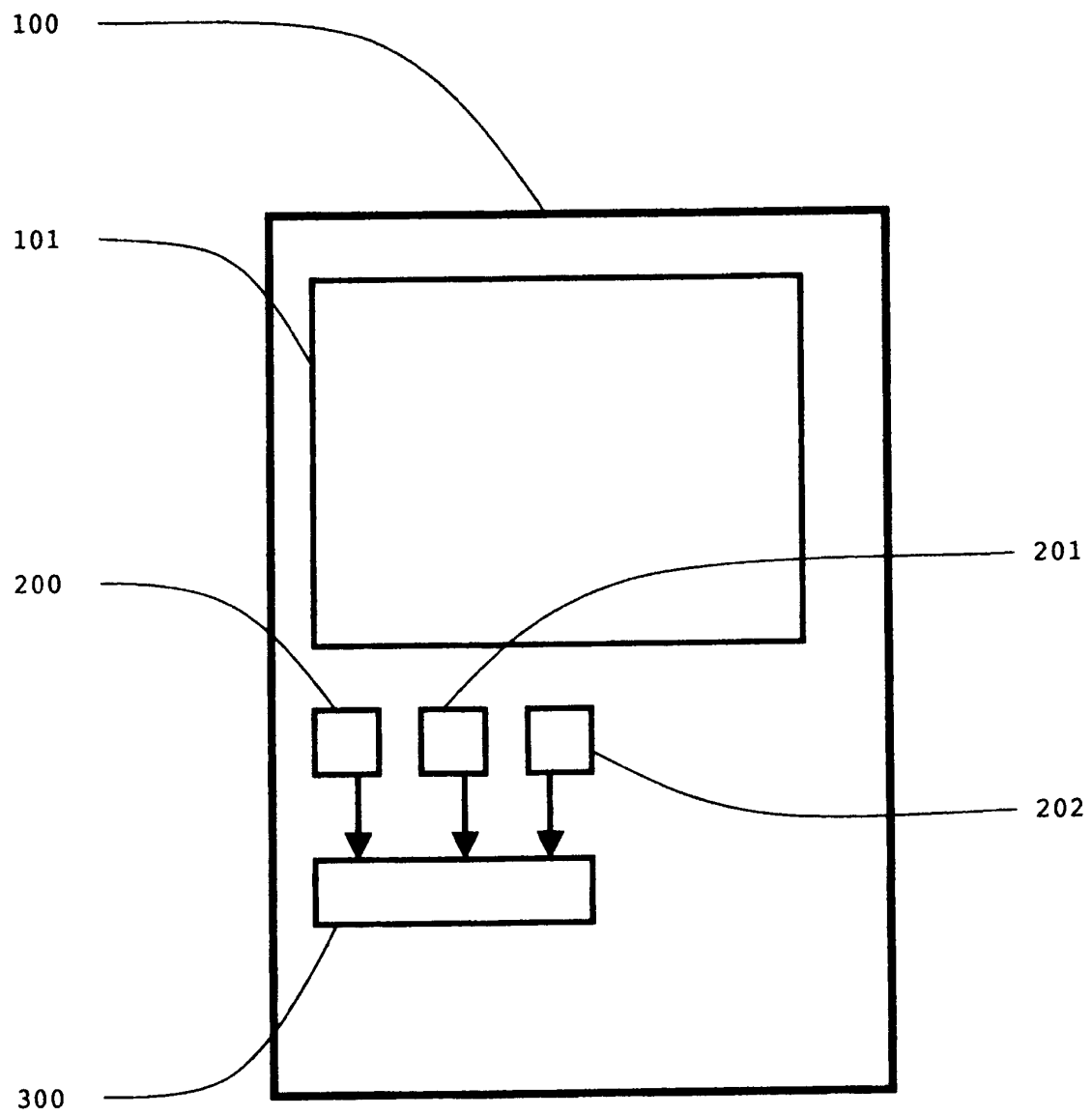


Figure 1

**APPARATUS AND METHOD FOR AUTOMATICALLY CHANGING THE
PROFILE OR MODE OF A MOBILE PHONE**

Background to the invention

Most mobile phones support a feature called 'Profiles'. Although the name may change from one device to another, the purpose of such a feature is to enable the user to quickly and easily change a number of parameters related to the phone at the same time. For example, the SonyEricsson K800i phone supports eight such profiles:- Normal, Silent, Meeting, In Car, Outdoors, Handsfree, Home and Office. Additionally, this phone, like many others, has a 'Silent mode'.

On this particular phone, setting the Profile sets a number of independent parameters at the same time. These include: Ring volume, Silent mode, Increasing ring, Vibrating alert, Key sound, Divert calls, Accept calls and Answering mode.

'Silent mode' usually overrides the parameters for ringing (by switching off the audible ring tone) although, according to the design of the mobile phone, it could also override other parameters e.g. Divert calls.

The use of Profiles is thus a convenience for the mobile phone user who can set a number of phone parameters at the same time.

Switching between Profiles can be achieved in a number of ways on many mobile phones. For example, Profiles may be selected by going to a menu in the phone marked 'Profiles' then selecting the desired Profile. For added

convenience on some phones, it may be possible to activate the Profile selection menu with a single button, for example a short press of the power on/off button.

On many mobile phones, switching 'Silent mode' on and off can be achieved by pressing and holding a single button (e.g. the [#] key). On some phones, for example the Palm Treo and the Apple iPhone, switching the Silent mode on and off is achieved by moving a mechanical switch on the device.

US Patent 7302280 "Mobile phone operation based upon context sensing" describes a mobile device which upon receiving an incoming message or notification responds thereto based at least in part on contextual information. Specifically this patent considers, by example, how a mobile phone may be adapted to respond to contextual data at the time that a call is received e.g. by muting the ring signal when the mobile device is picked up or by preventing the phone from vibrating when the phone is not held and is deemed (by virtue of input from sensors) to be placed on a generally horizontal surface.

The invention

According to the present invention, there is provided an improved method of automatically changing the profile or mode of a mobile phone according to the orientation ('face up' or 'face down') of the device on a generally horizontal surface such as a table or a desk.

The invention comprises a mobile phone with means to detect when the face (meaning the side with the display on or the side with the primary display in the case of a mobile phone with displays on both sides) is oriented towards or away from a generally horizontal surface, for example a table surface or a desk surface, and in response to detecting a change in orientation to automatically switch 'Silent mode' on or off, or select a particular 'Profile'.

In one embodiment of the invention, detecting the orientation of the mobile phone on a generally horizontal surface is achieved using a gravity-activated switch such as a mercury switch or similar such switch.

In another embodiment, detecting the orientation of the mobile phone on a generally horizontal surface is achieved using a light sensor.

Other methods of detecting the orientation of a mobile phone on a generally horizontal surface will be apparent to one skilled in the art and all such methods are included in the present invention.

In a preferred embodiment of the invention, the mobile phone shall use other movement-sensing inputs, for example from a tri-axis accelerometer, to help establish

that the mobile phone is stationary on the generally horizontal surface, and thus only enabling the automatic changing of Profile or switching Silent mode on or off only when the phone has been stationary on the surface for a defined period of time.

In a further embodiment of the invention, multiple sensors as described above may be used together to provide a more reliable set of input data that the phone can use to inform its decision as to (a) whether the phone is static on a generally horizontal surface and (b) the orientation of the device on the surface.

In a further preferred embodiment of the invention, the mobile phone shall be provided with the means, operable by selection of a menu item, by press of a button or by moving a mechanical switch, to enable or disable the automatic Profile or Silent mode selection described above.

The term mobile phone includes any portable device with a display and capable of making and/or receiving telephone calls.

The invention will now be described solely by way of example and with reference to the accompanying drawing in which Figure 1 shows a mobile phone 100 with a primary display 101. The mobile phone has three sensors, a light sensor 200, a gravity-operated switch sensor 201 and a tri-axis accelerometer 202. The sensors 200, 201 and 202 are connected to a processing unit 300 adapted to receive inputs from the sensors. By continuously sampling some or all of the sensors, the processing unit is able to determine (i) if the mobile phone is horizontal or close to horizontal (ii) the orientation of the device ('face

up' or 'face down') and (iii) if the device is being moved or is stationary. When the processing unit is satisfied with its own set of criteria that the mobile phone has remained in a given state for a specified period of time the profile or mode of the phone is changed. For example if the mobile phone has remained 'face down' and stationary for a period of, say, 10 seconds the processing unit 300 issues an instruction to change the profile to Silent and diverts incoming calls to voicemail. When the phone is subsequently moved (e.g. into a pocket) or placed 'face up' the profile is changed so that the phone generates audible alerts (Silent mode off) and cancels the diversion to voicemail.

Furthermore the mobile phone 100 may optionally generate an audible signal such as a mode-specific confirmatory sound (e.g. "bing-bong") or mode-specific spoken voice prompt (e.g. "Your phone is now in silent mode" or "Your phone is now in normal mode") upon each automatic change of mode.

For the sake of simplicity other components required for the normal operation of a mobile phone are not shown. The representation of the sensors 200, 201 and 202 and the processing unit 300 are logical representations of functional components.

Claims

1. A mobile phone adapted to automatically change the profile or mode of the device in consequence of receiving data from one or more sensors that can be interpreted by a processing unit to establish the orientation of the device.
2. A mobile phone as in claims 1 in which the profile or mode is changed when the device is placed 'face down' for a specified period of time.
3. A mobile phone as in claims 1 and 2 with a gravity-operated switch sensor used to establish the orientation of the device.
4. A mobile phone as in claims 1 and 2 with a light sensor used to establish the orientation of the device.
5. A mobile phone as in claim 1 and 2 with a tri-axis accelerometer sensor used to establish the orientation of the device.
6. A mobile phone as in claims 1 and 2 with two or more of the following sensors used to establish the orientation of the device with a greater degree of confidence than is possible with one sensor: gravity-operated switch sensor, light sensor and tri-axis accelerometer sensor.
7. A mobile phone as in claims 1 to 6 with a sensitive movement sensor such as a dual-axis or tri-axis accelerometer used to provide further data on the movement of the device to the processing unit.
8. A mobile phone as in claims 1 to 7 with means to activate or deactivate the automatic profile or mode selection function.
9. A mobile phone as in claims 2 to 8 in which a feature of the profile or mode selected when the

device is placed 'face down' for a specified period of time is to mute audible alert signals from the device.

10. A mobile phone as in claims 2 to 8 in which a feature of the profile or mode selected when the device is placed 'face down' for a specified period of time is to automatically activate call diversion so that calls to the mobile phone are redirected to a different telephone number.
11. A mobile phone as in claims 2 to 8 in which a feature of the profile or mode selected when the device is placed 'face down' for a specified period of time is to automatically activate call diversion so that calls to the mobile phone are redirected to a voicemail or similar messaging system.
12. A mobile phone as in claims 1 to 11 in which the profile or mode is changed when the device is no longer 'face down', having previously been in that state for a specified period of time.
13. A mobile phone as in claim 12 in which a feature of the of the profile or mode selected when the device is no longer 'face down', having previously been in that state, is to enable audible alert signals from the device.
14. A mobile phone as in claim 12 in which a feature of the profile or mode selected when the device is no longer 'face down', having previously been in that state, is to automatically cancel call diversion so that calls are no longer redirected another number or to a voicemail or similar messaging system.
15. A mobile phone according to any of the preceding claims in which the device generates an audible

signal to alert the user to the fact that profile or mode has been automatically changed.

9

Application No: GB0814561.7

Examiner: Gareth Griffiths

Claims searched: 1

Date of search: 11 November 2008

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-15	US2002/021278 A1 (MICROSOFT) whole document
X	1, 2, 3, 8, 12	US4504701 A (J C PENNEY) abstract
X	1-15	EP1355223 A2 (MICROSOFT) whole document
X.P	1, 2, 4, 5, 6, 7, 8, 9, 12, 13,	EP1885109 A2 (SAMSUNG) whole document
X	1-15	US2007/036348 A1 (RES IN MOTION) whole document
X	1-15	US2007/004451 A1 (ANDERSON) whole document

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	I	Patent document published on or after, but with priority date earlier than, the filing date of this application

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X:

--

Worldwide search of patent documents classified in the following areas of the IPC:

--

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC

International Classification:

10

Subclass	Subgroup	Valid From
1104M	0001/725	01/01/2006