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(71) Applicant *(for all designated States except US)*: **RESEARCH IN MOTION LIMITED** [CA/CA]; Patent Department, 295 Phillip Street, Waterloo, Ontario N2L 3W8 (CA).

(72) Inventor: **GRIFFIN, Jason, T.**; c/o Research In Motion Limited, 295 Phillip Street, Waterloo, Ontario N2L 3W8 (CA).

(74) Agent: **SMART & BIGGAR**; Attention: Ronald D. Faggetter, 438 University Avenue, Suite 1500, Box 111, Toronto, Ontario M5G 2K8 (CA).

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(54) Title: KEYBOARD FOR HAND-HELD DEVICES

(57) Abstract: A hand-held electronic device has a keyboard with a plurality of keys, each key having a substantially flat contact surface extending to the sides of each key. One of the sides of the key is beveled.

KEYBOARD FOR HAND-HELD DEVICES

CROSS-REFERENCE TO RELATED APPLICATION

The present application claims the benefit of prior provisional application serial number 60/716,736, filed September 13, 2005, the contents of which are hereby incorporated herein by reference.

BACKGROUND

This invention relates to a hand-held electronic device.

Numerous hand-held electronic devices are available as information stores for personal contacts, calendar appointments, and the like. Additionally, many hand-held devices wirelessly connect to the public Internet to allow for the sending and receiving of e-mail. Such hand-held devices may also provide more general Internet access, such as access to the World Wide Web. Further, many such hand-held devices also double as a cell phone.

A number of user interfaces have been utilised for these hand-held devices. Once such interface is a QWERTY keyboard. These QWERTY keyboards may be designed so they are particularly suited to use with the thumbs only. There is a trend for hand-held devices to shrink in size so as to provide a more streamlined look and so that the devices are more portable. This is particularly prevalent for hand-held devices which also provide cell phone functionality. As these devices become smaller, so do their keyboards, which provides a challenge to find a keyboard design that, despite its small size, remains usable.

The TREO^{tm} 600 by Palmone, Inc. copes with the small keyboard by providing domed keys. The domed shape of the keys effectively provides a gap between keys and also provides the user with a tactile target which assists the user in perceiving which key was pressed.

This invention seeks to provide an improved keyboard design suited for hand-held devices.

SUMMARY OF INVENTION

A hand-held electronic device has a keyboard with a plurality of keys, each key having a substantially flat contact surface extending to the sides of each key. One of the sides of the key is beveled.

Other features and advantages will become apparent from a review of the following description in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the figures which illustrate an example embodiment of the invention,

FIG. 1 is a front view of a hand-held electronic device made in accordance with an embodiment of this invention,

FIG. 2 is a schematic view of the hand-held electronic device of **FIG.1**,

FIG. 3 is a front view of the keyboard of the device of **FIG. 1**,

FIG. 4 is a cross-sectional view along the lines **4-4** of **FIG. 3** (simplified in that the exterior of each key behind the cut line is not shown), and

FIG. 5 is a cross-sectional view along the lines **5-5** of **FIG. 3** (simplified in that the exterior of each key behind the cut line is not shown).

DETAILED DESCRIPTION

The inventor has realised that a domed key keyboard has a number of disadvantages. Firstly, the dome provides a very small bulls-eye at the peak of the dome. In consequence, if the thumb of a user presses a key while not directly centered on the key, the tactile target provided by the dome shape suggests the key has not been squarely hit. This reduces the confidence level of the user. The typical consequence of reduced confidence is lower typing speed. It is therefore believed that the domed keys do not

promote fast input. Secondly, the top of the domes of the keys act as pressure points which, over extended use, can be irritating to the thumbs of a user.

FIG. 1 illustrates a hand-held mobile communication device **10** including a vertically elongated housing **12**, an input device, a keyboard **14**, and an output device, a display **16**, which is preferably a full graphic LCD. The keyboard **14** and display **16** are situated on the upper face **17** of the housing **12**. Other types of output devices may alternatively be utilized. Internally, the hand-held may be organized as illustrated in **FIG. 2**. Turning to **FIG. 2**, a processing device, a microprocessor **18**, is shown schematically as coupled between the keyboard **14** and the display **16**. The microprocessor **18** controls the operation of the display **16**, as well as the overall operation of the mobile device **10**, in response to actuation of keys on the keyboard **14** by the user.

In addition to the microprocessor **18**, other parts of the mobile device **10**, shown schematically in **FIG. 2**, include: a communications subsystem **100**; a short-range communications subsystem **102**; the keyboard **14** and the display **16**, along with other input/output devices including a set of auxiliary I/O devices **106**, a serial port **108**, a speaker **111** and a microphone **112**; as well as memory devices including a flash memory **116** and a Random Access Memory (RAM) **118**; and various other device subsystems **120**. The mobile device **10** is preferably a two-way RF communication device having voice and data communication capabilities. In addition, the mobile device **10** preferably has the capability to communicate with other computer systems via the Internet.

Operating system software executed by the microprocessor **18** is preferably stored in a persistent store, such as the flash memory **116**, but may be stored in other types of memory devices, such as a read only memory (ROM) or similar storage element. In addition, system software, specific device applications, or parts thereof, may be temporarily loaded into a volatile store, such as the RAM **118**. Communication signals received by the mobile device may also be stored to the RAM **118**.

The microprocessor **18**, in addition to its operating system functions, enables execution of software applications 130A-130N on the device **10**. A predetermined set of applications that control basic device operations, such as data and voice communications **130A** and **130B**, may be installed on the device **10** during manufacture. In addition, a

personal information manager (PIM) application may be installed during manufacture. The PIM is preferably capable of organizing and managing data items, such as e-mail, calendar events, voice mails, appointments, and task items. The PIM application is also preferably capable of sending and receiving data items via a wireless network **140**. Preferably, the PIM data items are seamlessly integrated, synchronized and updated via the wireless network **140** with the device user's corresponding data items stored or associated with a host computer system.

Communication functions, including data and voice communications, are performed through the communication subsystem **100**, and possibly through the short-range communications subsystem **102**. The communication subsystem **100** includes a receiver **150**, a transmitter **152**, and one or more antennas **154** and **156**. In addition, the communication subsystem **100** also includes a processing module, such as a digital signal processor (DSP) **158**, and local oscillators (LOs) **160**. The specific design and implementation of the communication subsystem **100** is dependent upon the communication network in which the mobile device **10** is intended to operate. For example, the communication subsystem **100** of the mobile device **10** may be designed to operate with the Mobitex™, DataTAC™ or General Packet Radio Service (GPRS) mobile data communication networks and may also be designed to operate with any of a variety of voice communication networks, such as AMPS, TDMA, CDMA, PCS, GSM, etc. Other types of data and voice networks, both separate and integrated, may also be utilized with the mobile device **10**.

Network access requirements vary depending upon the type of communication system. For example, in the Mobitex™ and DataTAC™ networks, mobile devices are registered on the network using a unique personal identification number or PIN associated with each device. In GPRS networks, however, network access is associated with a subscriber or user of a device. A GPRS device therefore requires a subscriber identity module, commonly referred to as a SIM card, in order to operate on a GPRS network.

When required network registration or activation procedures have been completed, the mobile device **10** may send and receive communication signals over the communication network **140**. Signals received from the communication network **140** by the antenna **154** are routed to the receiver **150**, which provides for signal amplification,

frequency down conversion, filtering, channel selection, etc., and may also provide analog to digital conversion. Analog-to-digital conversion of the received signal allows the DSP **158** to perform more complex communication functions, such as demodulation and decoding. In a similar manner, signals to be transmitted to the network **140** are processed (e.g. modulated and encoded) by the DSP **158** and are then provided to the transmitter **152** for digital to analog conversion, frequency up conversion, filtering, amplification and transmission to the communication network **140** (or networks) via the antenna **156**.

In addition to processing communication signals, the DSP **158** provides for control of the receiver **150** and the transmitter **152**. For example, gains applied to communication signals in the receiver **150** and transmitter **152** may be adaptively controlled through automatic gain control algorithms implemented in the DSP **158**.

In a data communication mode, a received signal, such as a text message or web page download, is processed by the communication subsystem **100** and is input to the microprocessor **18**. The received signal is then further processed by the microprocessor **18** for an output to the display **16**, or alternatively to some other auxiliary I/O devices **106**. A device user may also compose data items, such as e-mail messages, using the keyboard **14** and/or some other auxiliary I/O device **106**. The composed data items may then be transmitted over the communication network **140** via the communication subsystem **100**.

In a voice communication mode, overall operation of the device is substantially similar to the data communication mode, except that received signals are output to a speaker **111**, and signals for transmission are generated by a microphone **112**. Alternative voice or audio I/O subsystems, such as a voice message recording subsystem, may also be implemented on the device **10**. In addition, the display **16** may also be utilized in voice communication mode, for example to display the identity of a calling party, the duration of a voice call, or other voice call related information.

The short-range communications subsystem **102** enables communication between the mobile device **10** and other proximate systems or devices, which need not necessarily be similar devices. For example, the short-range communications subsystem may include an infrared device and associated circuits and components, or a Bluetooth™

communication module to provide for communication with similarly-enabled systems and devices.

Turning to **FIG. 3**, keyboard **14** has a plurality of indicia bearing keys **200** arranged in three rows. Some of the keys **200** bear letters, and these letter bearing keys form a QWERTY layout. Each key **200** is four-sided having an inner side **202**, outer side **204**, upper side **206**, and lower side **208**. The inner side **202** for the keys **200L**, which keys are to the left of the longitudinal midline **M** of the keyboard, is at their right side, whereas the inner side **202** for the keys **200R**, which keys are to the right of midline **M**, is at their left side. Each of the keys has a straight edge **210** proximate its inner side **202** which extends between upper side **206** and lower side **208** of the key. Each key presents a generally parallelogram-shaped outline. (However, the lower side **208** of each key in the two columns of keys closest to the longitudinal midline **M** of the keyboard **14**, such as key **200V**, is shorter than the upper side **206** of these keys.) The generally parallelogram-shaped outline of the keys provides each key, such as key **200V**, with a major axis **A** aligned with its length dimension. The major axis of each key makes an angle, **B**, of between 20° and 70°, with the midline **M** of the keyboard, with this angle being a negative angle for keys **200L** and a positive angle for keys **200R**. One suitable choice for this angle is 40°.

With reference to **FIGS. 4** and **5**, it will be apparent that each key **200** has a flat contact surface **220** which parallels the upper face **17** of the housing and extends to each of the four sides **202, 204, 206, 208** of the key. Further, it will be apparent that inner side **202** of each key **200** is beveled. This means that the inner side **202** of each key has a sloping planar surface **222** meeting the flat contact surface **220** along straight edge **210** at an obtuse angle **C**. Angle **C** may be between about 25° and 45°. Planar surface **222** extends the length of the key from upper side **206** to lower side **208**.

As shown, straight edge **210** has a slight radius. The only requirement is that the edge **210** be sufficiently sharp so that it is felt by a user when pressing the key.

The outer side **204** of each key, which is opposite inner side **202**, has a planar surface **224** meeting the flat contact surface **220** along a straight edge **230** at a right angle. Similarly upper side **206** has a planar surface **226** meeting the flat contact surface **220** at a right angle and lower side **208** has a planar surface **228** meeting the flat contact surface **220**

at a right angle. While, in this example embodiment, these angles are shown as right angles, each could equally be substantially a right angle, which may be taken as any angle between about 80° and 100° such that when a key is pressed by the thumb of a user, the flesh of the thumb does not appreciably contact any of planar surfaces **224**, **226**, or **228**.

It will be apparent from **FIG. 3** that the inner sides **202** of the column of keys **200L**, **200R** on either side of the midline **M** of the keyboard face each other. In consequence, the sloping planar surface **222** of keys **200L** on one side of the midline **M** is next to the sloping planar surface **222** of keys **200R** on the other side of the midline **M**.

A pin **232** depends from each key **200** and sits atop a dip switch (not shown). Returning to **FIG. 3**, it will be apparent that for key **200W**, the alphabetic letter "W" extends on the flat contact surface **220** past straight edge **210** onto the sloping planar surface **222**. Further, in addition to keys **200**, there are additional keys **240** on keyboard **14** such as on-hook key **240a**, off-hook key **240b**, shift key **240c** and capital lock key **240d**. Like keys **200**, a pin extends from each of these additional keys **240** atop a dip switch.

The keys **200** and **240** of keyboard **14** may be made of a hard plastic material and the keys may be glued to a flexible film (such as an elastomeric or rubber film). In consequence, when pressure is applied to the contact surface **220** of any key **200**, the flexible film is deformed to allow the key to be depressed so as to press its pin **232** against the underlying dip switch. The resulting electrical signal from the dip switch allows the microprocessor **18** (**FIG. 2**) to register the key press.

In operation, a user may grasp hand-held **10** such that upper surface **17** faces her, and her thumbs are over the keyboard **14**. The user may then use her thumbs to depress selected keys **200** and **240** of the keyboard. In this regard, the angle β that the major axis of a key **200** makes with the longitudinal midline of the keyboard positions the key **200** so that it is more in line with the long dimension of the thumb as the thumb strikes the key. The beveled inner side **202** of a key **200** effectively provides a gap between the key and the one neighbouring key which faces the beveled inner side **202**. This reduces the likelihood of inadvertently hitting two keys at the same time. Further, since only one side of the key is beveled, the size of contact surface **220** remains relatively large. As a thumb presses on a key **200**, the user will feel the straight edge **210** and, likely, sloping planar surface **222** of

the key. This tactile target will assure the user that her thumb is striking the intended key. Further, because the straight edge **210** and sloping planar surface **222** extend along the entire length of the key, the "bulls-eye" of the target extends along the length of the key. In consequence, there is a range of thumb positions on the key which will provide a user with feedback indicating the key has been properly struck. Of course the straight edge **210** and sloping planar surface **222**, if not felt by a user who is trying to press a key, will indicate to the user that the intended key has not been properly struck.

With the sloping planar surface **222** of the keys **200L**, **200R** on either side of the midline **M** of the keyboard **14** being adjacent each other, a user has enhanced room to thumb keys on either side of the midline **M** of the keyboard.

Since the tactile feel of a key **200** indicates the key is properly struck for a range of thumb positions, the "bulls-eye" for a proper key strike is larger than with a key which provides the tactile feel that it has been properly struck only where the portion of the thumb striking the key is precisely positioned on the key. Such is a perceived problem with a domed key, where the tactile feel indicates a key is properly struck only if hit squarely so that the peak of the dome is at the middle of the striking portion of the thumb. A larger target bulls-eye means a higher percentage of key strikes providing feedback indicating a proper key strike. This higher percentage results in a higher confidence level for the user which translates to a faster typing speed. It should also be apparent that keys providing a tactile target to a user better builds confidence, and therefore results in a faster typing speed, than do keys providing effectively no tactile target, such as keys simply having a flat contact surface and no other tactile features.

The sloped planar face **222** of each key **200**, while not on the flat contact surface **220** of the key nevertheless faces the user. In consequence, if during the printing of letters on the keys **200**, a letter is partially printed on this sloping face **222** (as is the case with key **200**W shown in **FIG. 3**), the letter will remain legible to the user. This is advantageous given the small size of the keys **200** and the inherent manufacturing tolerances in printing letters on the keyboard **14**.

Although contact surface **220** of keys **200** has been described as flat in the example embodiment, this surface could instead be substantially flat, such that, for example,

a suitable contact surface would be a surface which is slightly convex or concave. Similarly, although sloped surface **222** has been described as planar, this surface could instead be substantially planar, such that, for example, a suitable substantially planar surface would be a surface which is slightly scalloped along its length. Similarly, while sides **204**, **206**, **208**, and side **202** below sloped surface **222** have been described as planar, these sides could, equally, be substantially planar and thus, for example, the sides could be slightly bowed. Furthermore, these sides could also notch in, such that each key **200** had an enlarged head and narrower neck.

Although the keys **200** have been shown as having a generally parallelogram-shaped outline, equally other key outlines would be possible. For example, the keys could have an oval outline with a major axis aligned with axis A. This is not preferred, however, since the planar surface **222** of the keys would be narrower proximate the upper and lower edges of the keys and, consequently, the keys would have a smaller effective target area. The keys could also have a rectangular outline with the keys having their length either aligned with axis **A** or with the midline **M** of the keyboard. Again, however, these options are not preferred as they have ergonomic drawbacks.

While keyboard **14** is shown as having a QWERTY layout, any other know layout, such as an AZERTY, QUERTZ, or Dvorak layout, is possible.

It will be apparent that keyboard **14** may be utilized with a hand-held device which provides different functionality than hand-held **10**, such as a hand-held which merely acts as an address book.

Other modifications will be apparent to those skilled in the art and, therefore, the invention is defined in the claims.

WHAT IS CLAIMED IS:

1. A hand-held electronic device comprising:

a keyboard, said keyboard having a plurality of keys, each key having a substantially flat contact surface extending to sides of said each key, one side of said sides being bevelled.

2. The device of claim 1 wherein said one side has a substantially planar surface meeting said contact surface at an obtuse angle.

3. The device of claim 2 wherein said obtuse angle is between 25° and 45°.

4. The device of claim 2 or claim 3 wherein said planar surface of said one side meets said contact surface along a straight edge.

5. The device of any one of claim 1 to claim 4 wherein said one side is a first side of said sides, a second side of said sides opposite said first side having a substantially planar surface meeting said contact surface at substantially a right angle.

6. The device of claim 5 wherein each of said sides, other than said first side, has a substantially planar surface meeting said contact surface at substantially a right angle.

7. The device of claim 5 or claim 6 wherein said first side planar surface extends along a length of said each key between endmost sides of said each key.

8. The device of claim 4 wherein said keys comprise first keys located left of a midline of said keyboard and second keys located right of said midline of said keyboard and wherein said straight edge of each first key is at a right hand side of said first key and wherein said straight edge of each second key is at a left hand side of said second key.

9. The device of claim 8 wherein said each key has a major axis which makes an angle of between 20 and 70 degrees with said midline.

10. The device of claim 8 wherein said each key has a major axis which makes an angle of about 40 degrees with said midline.

11. The device of claim 9 wherein said major axis of each of said first keys makes a negative angle with said midline and said major axis of each of said second keys makes a positive angle with said midline.

12. The device of any one of claim 8 to claim 11 wherein a length dimension of each of said keys is aligned with said major axis of each of said keys.

13. The device of any one of claim 1 to claim 12 wherein said contact surface of each of said keys has a generally parallelogram shaped outline.

14. The device of any one of claim 1 to claim 13 wherein said keys bear alphabetic letters.

15. The device of claim 5 wherein said keys bear alphabetic letters and said alphabetic letters extend on said contact surface and at least some of said alphabetic letters extend from said contact surface onto said first side planar surface.

16. The device of claim 15 wherein said keys are arranged in three rows and bear alphabetic letters according to the layout of a QWERTY keyboard.

17. The device of any one of claim 1 to claim 16 further comprising:

a display; and

a processor operatively connected to said keyboard and said display.

18. A hand-held electronic device, comprising:

a keyboard on an upper face of said hand-held electronic device;

said keyboard having a plurality of keys;

each key of said keys having an upper surface, said upper surface comprising a first substantially planar upper surface portion and a second substantially planar upper surface portion, said first planar upper surface portion meeting said second planar upper surface portion at an angle;

said second planar upper portion substantially paralleling said face;

said first planar upper portion angled with respect to said second upper planar portion such that said first upper planar portion slopes from said second upper planar portion toward said upper face.

19. The device of claim 18 wherein said second planar upper surface portion meets said first planar upper surface portion at a straight edge.

20. The device of claim 18 or claim 19 wherein said second planar upper surface portion meets said first planar upper surface portion at an angle of between 25° and 45°.

21. The device of any one of claim 18 to claim 20 wherein said each key has a first substantially planar side surface and an opposed second substantially planar side surface extending at substantially a right angle to said second upper planar portion.

22. The device of claim 21 wherein said first planar side surface meets said first upper planar portion at a straight edge and wherein said second planar side surface meets said second upper planar portion at a straight edge.

23. The device of any one of claim 18 to claim 22 wherein said each key has first and second substantially planar end surfaces meeting said second planar upper portion at substantially a right angle.

24. The device of any one of claim 18 to claim 23 wherein said keys comprise first keys located left of a midline of said keyboard and second keys located right of said midline of said keyboard and wherein said first planar upper portion of each first key is at a right hand side of said first key and wherein said first planar upper portion of each second key is at a left hand side of said second key.

25. The device of any one of claim 18 to claim 24 wherein said second upper planar portion of said each key has a generally parallelogram shaped outline.

26. A hand-held electronic device comprising:

a keyboard, said keyboard having a plurality of keys, each key having a flat contact surface extending to sides of said each key, one side of said sides being bevelled.

27. The device of claim 26 wherein said one side has a planar surface meeting said contact surface at an obtuse angle.

28. The device of claim 26 or claim 27 wherein said one side is a first side of said sides, a second side of said sides opposite said first side having a planar surface meeting said contact surface at substantially a right angle.

29. The device of claim 28 wherein each of said sides, other than said first side, has a planar surface meeting said contact surface at substantially a right angle.

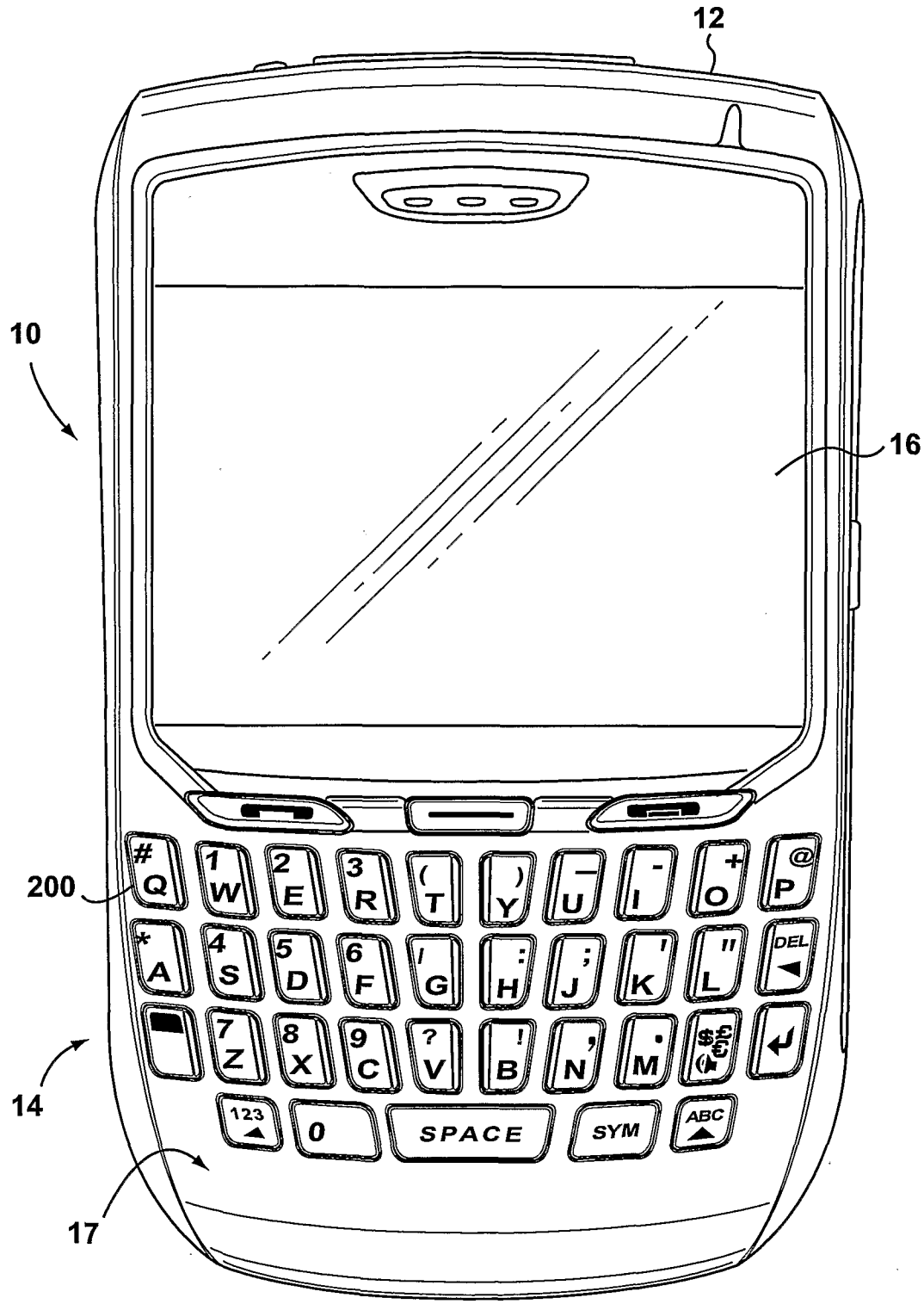


FIG. 1

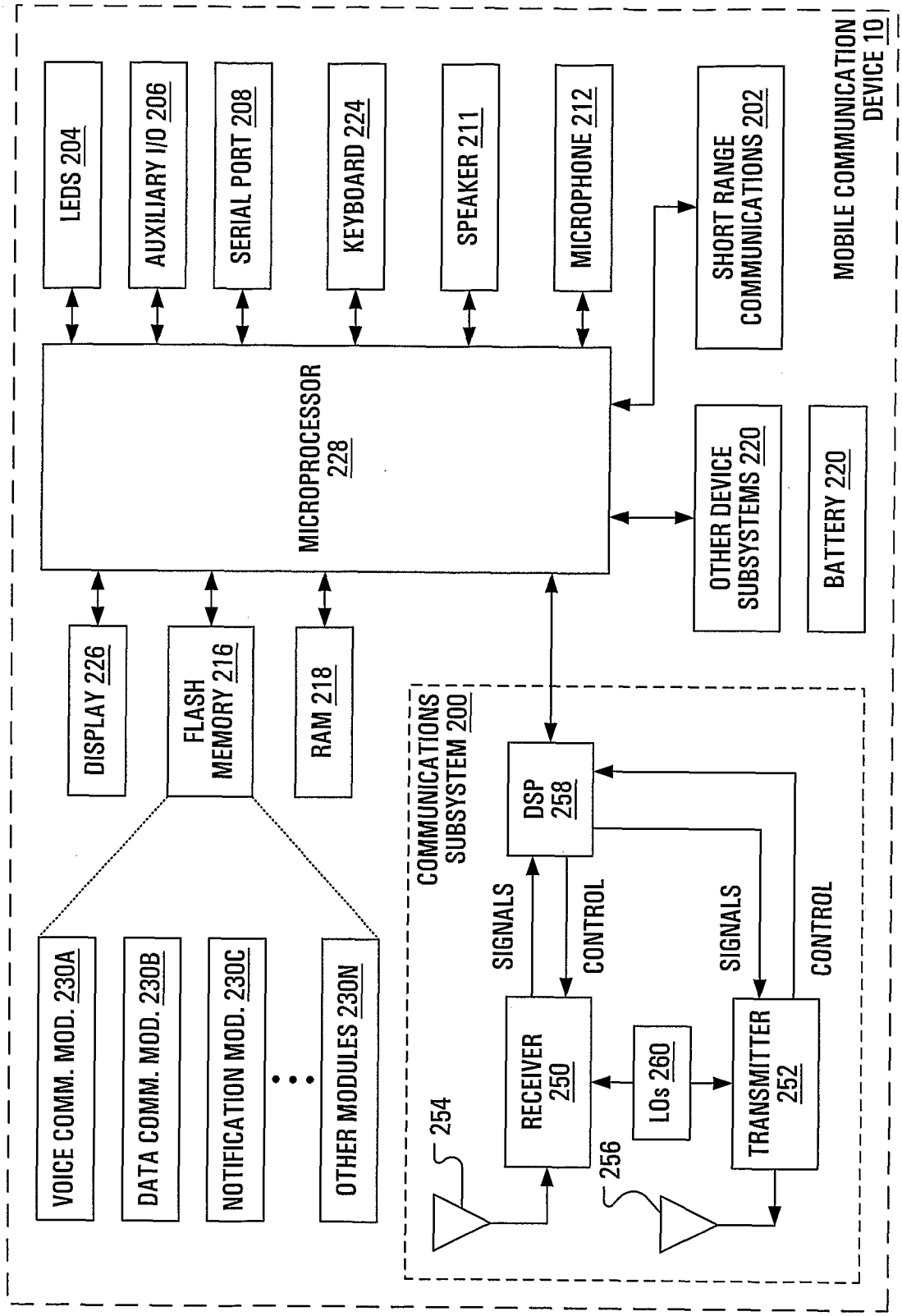

MOBILE COMMUNICATION DEVICE 10
LEDS 204
AUXILIARY I/O 206
SERIAL PORT 208
KEYBOARD 224
SPEAKER 211
MICROPHONE 212
SHORT RANGE COMMUNICATIONS 202
MICROPROCESSOR 228
OTHER DEVICE SUBSYSTEMS 220
BATTERY 220
DISPLAY 226
FLASH MEMORY 216
RAM 218
COMMUNICATIONS SUBSYSTEM 200
DSP 258
SIGNALS
CONTROL
SIGNALS
CONTROL
RECEIVER 250
LOs 260
TRANSMITTER 252
254
256
VOICE COMM. MOD. 230A
DATA COMM. MOD. 230B
NOTIFICATION MOD. 230C
OTHER MODULES 230N

FIG. 2

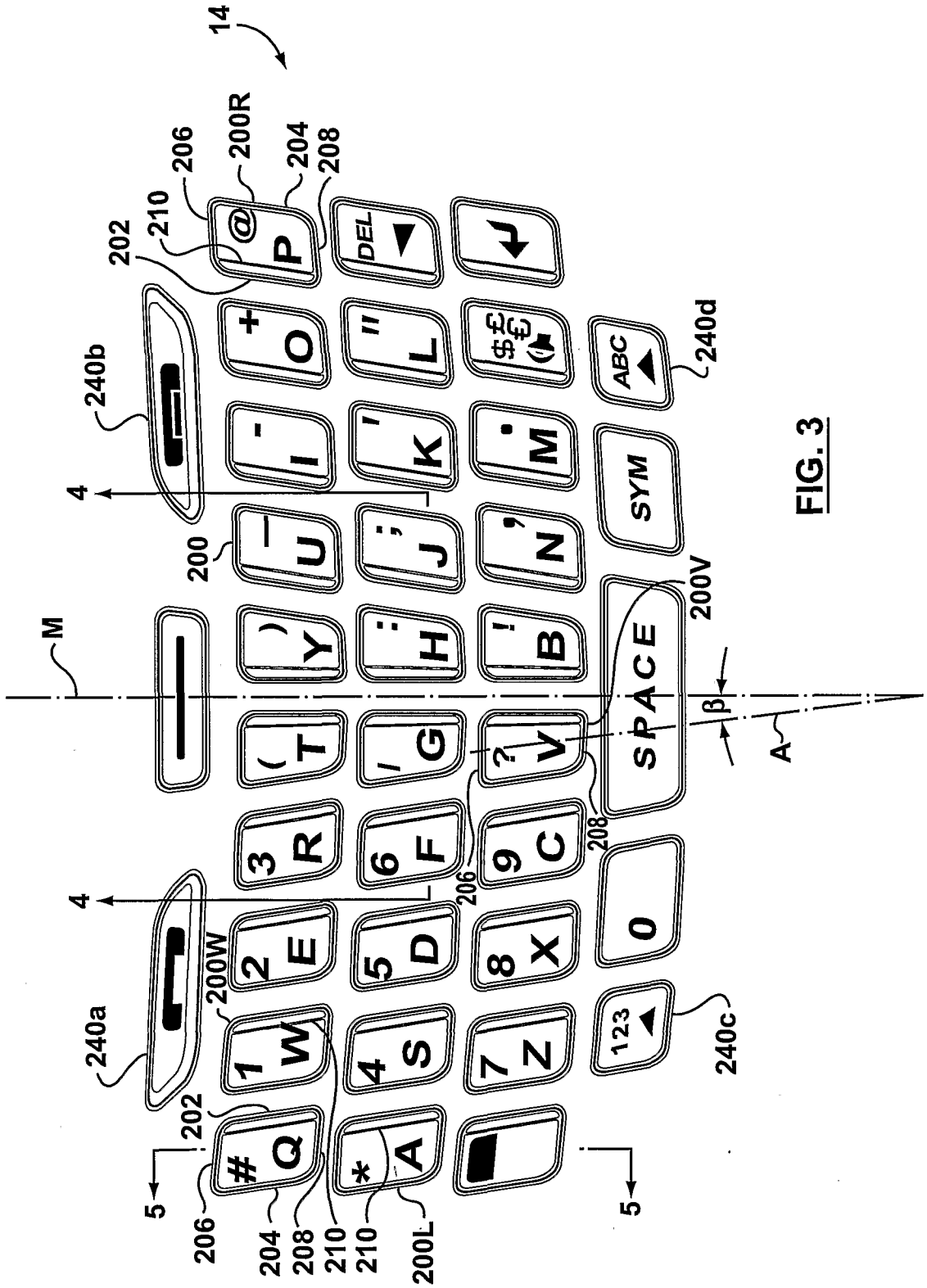
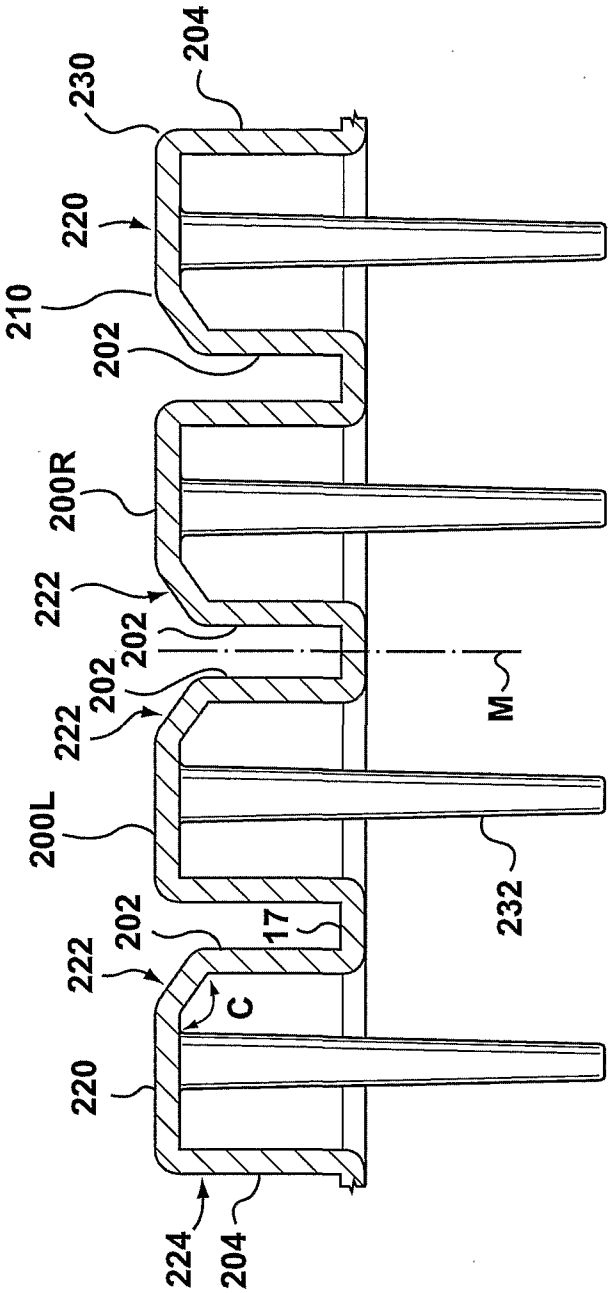

14
200R
206
204
208
210
202
240b
4
200
M
200V
240d
ABC
SYM
SPACE
β
A
200W
240a
202
206
204
208
210
210
200L
5
5
123
240c
DEL

FIG. 3


230
204
220
210
202
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222
202
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222
M
200L
232
202
17
222
C
220
224
204

FIG. 4

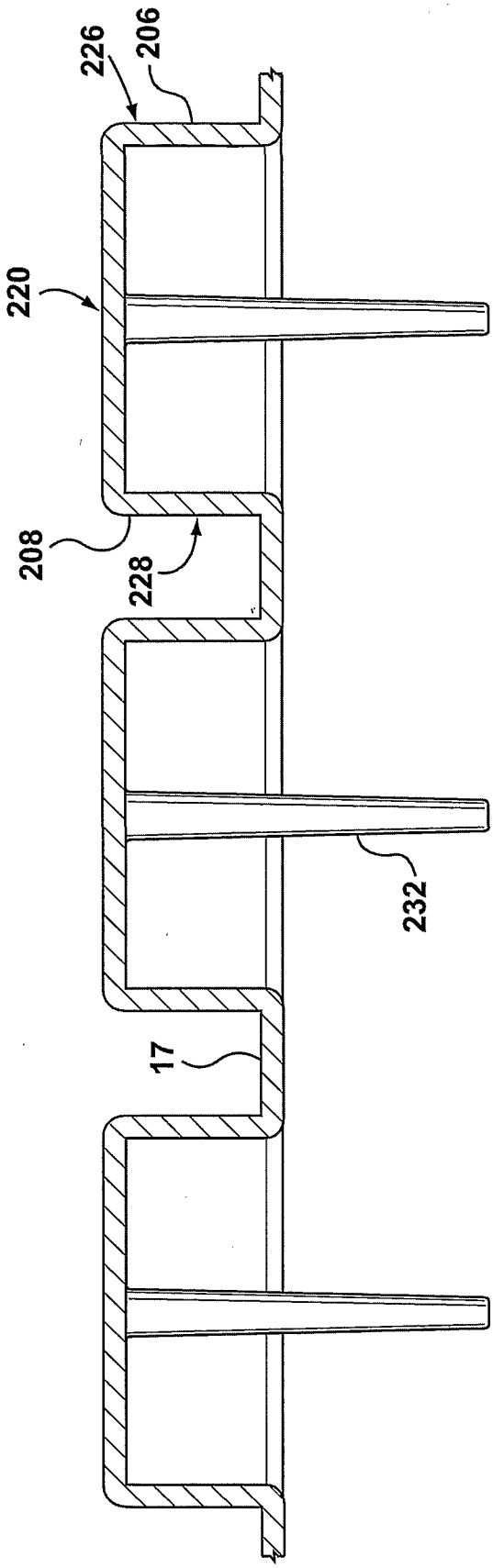

FIG. 5

VIII-5-1	**Declaration: Non-prejudicial disclosure or exceptions to lack of novelty** Declaration as to non-prejudicial disclosures or exceptions to lack of novelty (Rules 4.17(v) and 51bis.1(a)(v)): Name (LAST, First)	in relation to this international application RESEARCH IN MOTION LIMITED declares that the subject matter claimed in this international application was disclosed as follows:
VIII-5-1(i)	Kind of disclosure:	abuse
VIII-5-1(ii)	Date of disclosure:	29 May 2005 (29.05.2005)
VIII-5-1(iii)	Title of disclosure:	"Is this a photo of the newest BlackBerry?" (posting on web site www.bbhub.com; picture re-posted on web site 12 September 2005 (12.09.2005))
VIII-5-1(iv)	Place of disclosure:	
VIII-5-1(i)	Kind of disclosure:	abuse
VIII-5-1(ii)	Date of disclosure:	18 September 2005 (18.09.2005)
VIII-5-1(iii)	Title of disclosure:	"BlackBerry 8700 live shot" (posting on web site www.engadget.com)
VIII-5-1(iv)	Place of disclosure:	
VIII-5-1(i)	Kind of disclosure:	abuse
VIII-5-1(ii)	Date of disclosure:	19 September 2005 (19.09.2005)
VIII-5-1(iii)	Title of disclosure:	"Rumor: RIM 8700 Electron photos" (posting on web site http://cellphones.ubergizmo.com)
VIII-5-1(iv)	Place of disclosure:	
VIII-5-1(i)	Kind of disclosure:	abuse
VIII-5-1(ii)	Date of disclosure:	19 September 2005 (19.09.2005)
VIII-5-1(iii)	Title of disclosure:	"Photos du BlackBerry 8700" (posting on web site www.pdafrance.com)
VIII-5-1(iv)	Place of disclosure:	

VIII-5-1(i)	Kind of disclosure:	abuse
VIII-5-1(ii)	Date of disclosure:	28 September 2005 (28.09.2005)
VIII-5-1(iii)	Title of disclosure:	"Blackberry 8700" (posting on web site http://ployer.com)
VIII-5-1(iv)	Place of disclosure:	
VIII-5-1(i)	Kind of disclosure:	abuse
VIII-5-1(ii)	Date of disclosure:	04 October 2005 (04.10.2005)
VIII-5-1(iii)	Title of disclosure:	"Yet Another Blackberry 8700 Picture" (posting on web site www.blackberrycool.com)
VIII-5-1(iv)	Place of disclosure:	
VIII-5-1(v)	This declaration is made for the purposes of:	all designations

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2005/001572

A. CLASSIFICATION OF SUBJECT MATTER
IPC: ***B41J 5/12*** (2006.01) , ***G06F 15/02*** (2006.01) , ***G06F 3/023*** (2006.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(7): B41J/All, G06F/All

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
None

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)
Delphion, Canadian Patent Database
Keywords: shape, keys, bevelled, handheld device, edge

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CA 2517815 A1 (RESEARCH IN MOTION LIMITED) 19 March 2002 (19.03.2002) Whole document	1-29
Y	US 5061094 A (TA TRIUMPH-ALDER AG) 29 October 1991 (29.10.1991) Figure 1	1-29
Y	US 6847310 A (BSQUARE CORPORATION) 25 January 2005 (25.01.2005)	1-11, 14, 16, 17, 26-29
A	US 6752552 A (SABATO) 22 June 2004 (22.06.2004) Figure 2E	1-29
A	US 2001/0031167 A (MORELOS) 18 October 2001 (18.10.2001) Whole document	1-29

[ ] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
06 June 2006 (06-06-2006)	14 June 2006 (14-06-2006)

Name and mailing address of the ISA/CA	Authorized officer
Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001(819)953-2476	Victoria Dempster (819) 934-4272

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/CA2005/001572

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
CA2517815	19-03-2002	CA2276697 A1	29-12-1999
		CA2342745 A1	05-10-2001
		CA2357562 A1	19-03-2002
		CA2389985 A1	12-04-2003
		CA2395021 A1	25-01-2003
		CA2405287 A1	29-12-1999
		CA2426359 A1	05-10-2001
		DE60103946D D1	29-07-2004
		DE60103946T T2	07-07-2005
		EP1143327 A1	10-10-2001
		USD464995S S1	29-10-2002
		USD490119S S1	18-05-2004
		US6278442 B1	21-08-2001
		US6396482 B1	28-05-2002
		US6452588 B2	17-09-2002
		US6489950 B1	03-12-2002
		US6611254 B1	26-08-2003
		US6611255 B2	26-08-2003
		US6867763 B2	15-03-2005
		US6873317 B1	29-03-2005
		US6919879 B2	19-07-2005
		US2002044136 A1	18-04-2002
		US2002149567 A1	17-10-2002
		US2003206156 A1	06-11-2003
US5061094	29-10-1991	CH682474 A5	30-09-1993
		DE3942597 A1	27-06-1991
		FR2656253 A1	28-06-1991
		GB2239349 A	26-06-1991
		IT1244073 B	05-07-1994
		JP2061688C C	10-06-1996
		SE468887 B	05-04-1993
		SE9003845 A	23-06-1991
US6847310	25-01-2005	AU2003237503 A1	06-01-2004
		CN1669226 A	14-09-2005
		EP1532740 A1	25-05-2005
		JP2005531064T T	13-10-2005
		WO2004001980 A1	31-12-2003
US6752552	22-06-2004	AU756645 B2	16-01-2003
		AU5201800 A	09-01-2001
		AUPQ111599D D0	15-07-1999
		AUPQ452599D D0	06-01-2000
		BR0012527 A	02-04-2002
		CA2375208 A1	28-12-2000
		CN1159159C C	28-07-2004
		EP1187722 A1	20-03-2002
		JP2003502760T T	21-01-2003
		MXPA02000140 A	21-07-2003
		NZ515376 A	26-09-2003
		US6991390 B2	31-01-2006
		WO0078551 A1	28-12-2000
		ZA200110523 A	23-12-2002
US2001031167	18-10-2001	US6382854 B2	07-05-2002