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(54) **COMMUNICATIONS SYSTEM PROVIDING AUTOMATIC TEXT-TO-SPEECH CONVERSION FEATURES AND RELATED METHODS**

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This patent is subject to a terminal disclaimer.

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(51) **Int. Cl.**
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(52) **U.S. Cl.** **455/575.2**; 455/563; 455/41.1; 455/90.3; 704/270.1; 379/420.01

(58) **Field of Classification Search** 455/569.1, 455/569.2, 41.1, 41.2, 563, 575.2, 575.9, 455/420; 379/420.01–420.04; 704/270.1
See application file for complete search history.

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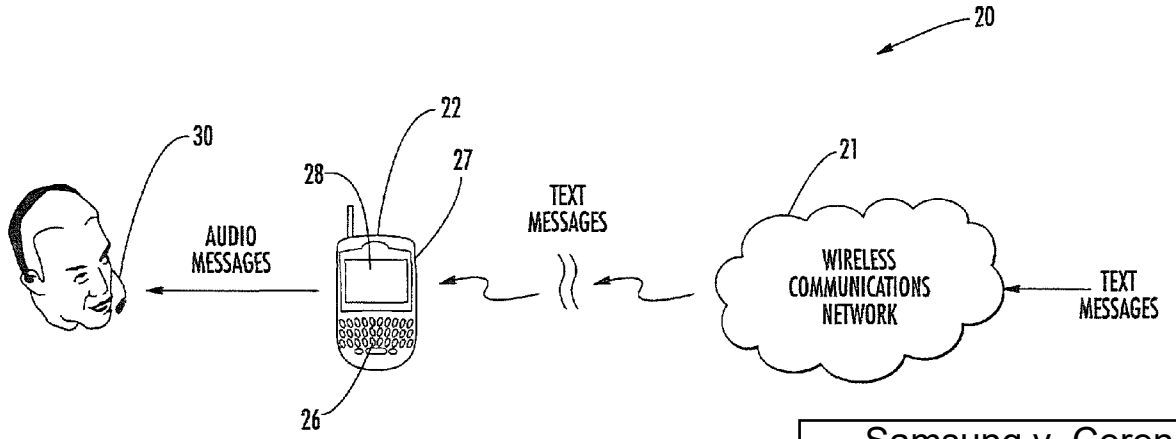
(57) **ABSTRACT**

A communications system may include at least one mobile wireless communications device, and a wireless communications network for sending text messages thereto. More particularly, the at least one mobile wireless communications device may include a wireless transceiver and a controller for cooperating therewith for receiving text messages from the wireless communications network. It may further include a headset output connected to the controller. The controller may be for switching between a normal message mode and an audio message mode based upon a connection between the headset output and a headset. Moreover, when in the audio message mode, the controller may output at least one audio message including speech generated from at least one of the received text messages via the headset output.

22 Claims, 6 Drawing Sheets



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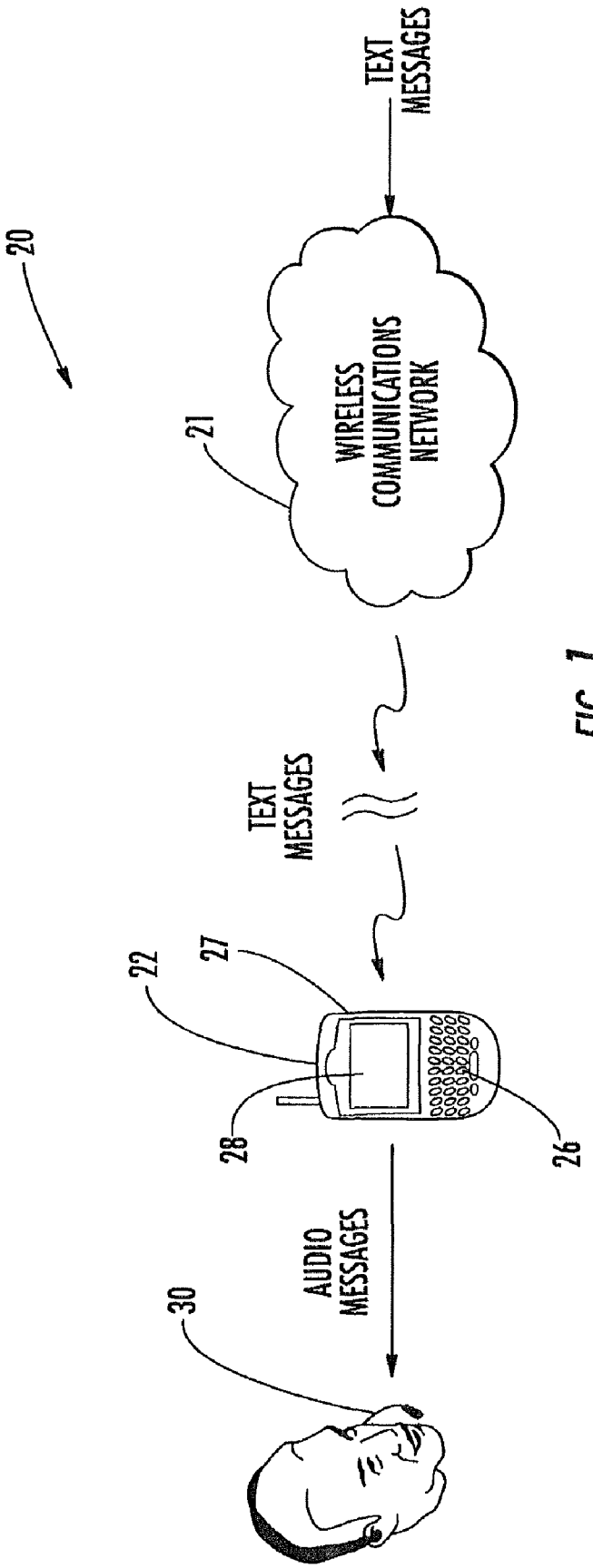
20
TEXT MESSAGES
WIRELESS COMMUNICATIONS NETWORK
21
TEXT MESSAGES
22
27
28
26
AUDIO MESSAGES
30

FIG. 1

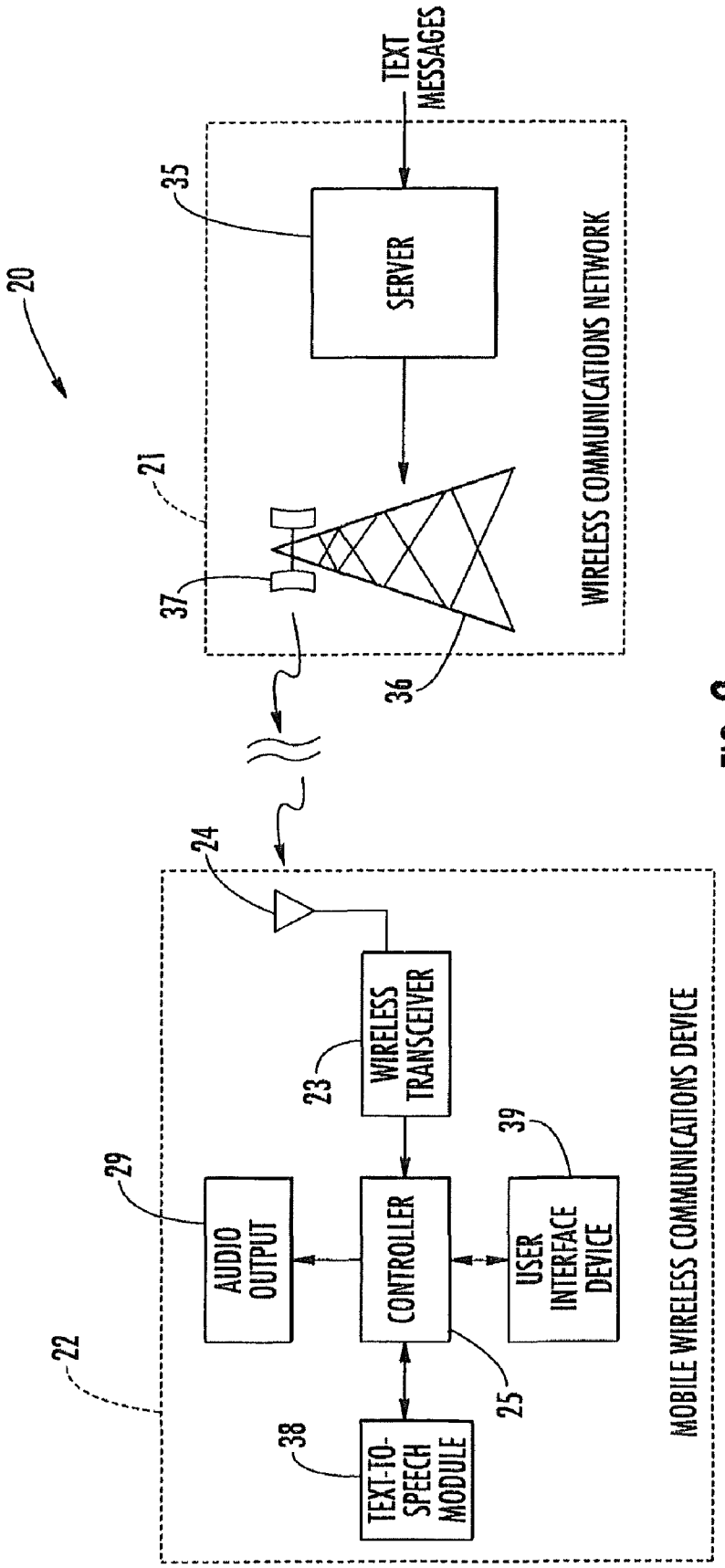
20
TEXT MESSAGES
35
SERVER
WIRELESS COMMUNICATIONS NETWORK
21
37
36
24
WIRELESS TRANSCEIVER
23
29
AUDIO OUTPUT
CONTROLLER
USER INTERFACE DEVICE
39
22
25
38
TEXT-TO-SPEECH MODULE
MOBILE WIRELESS COMMUNICATIONS DEVICE

FIG. 2

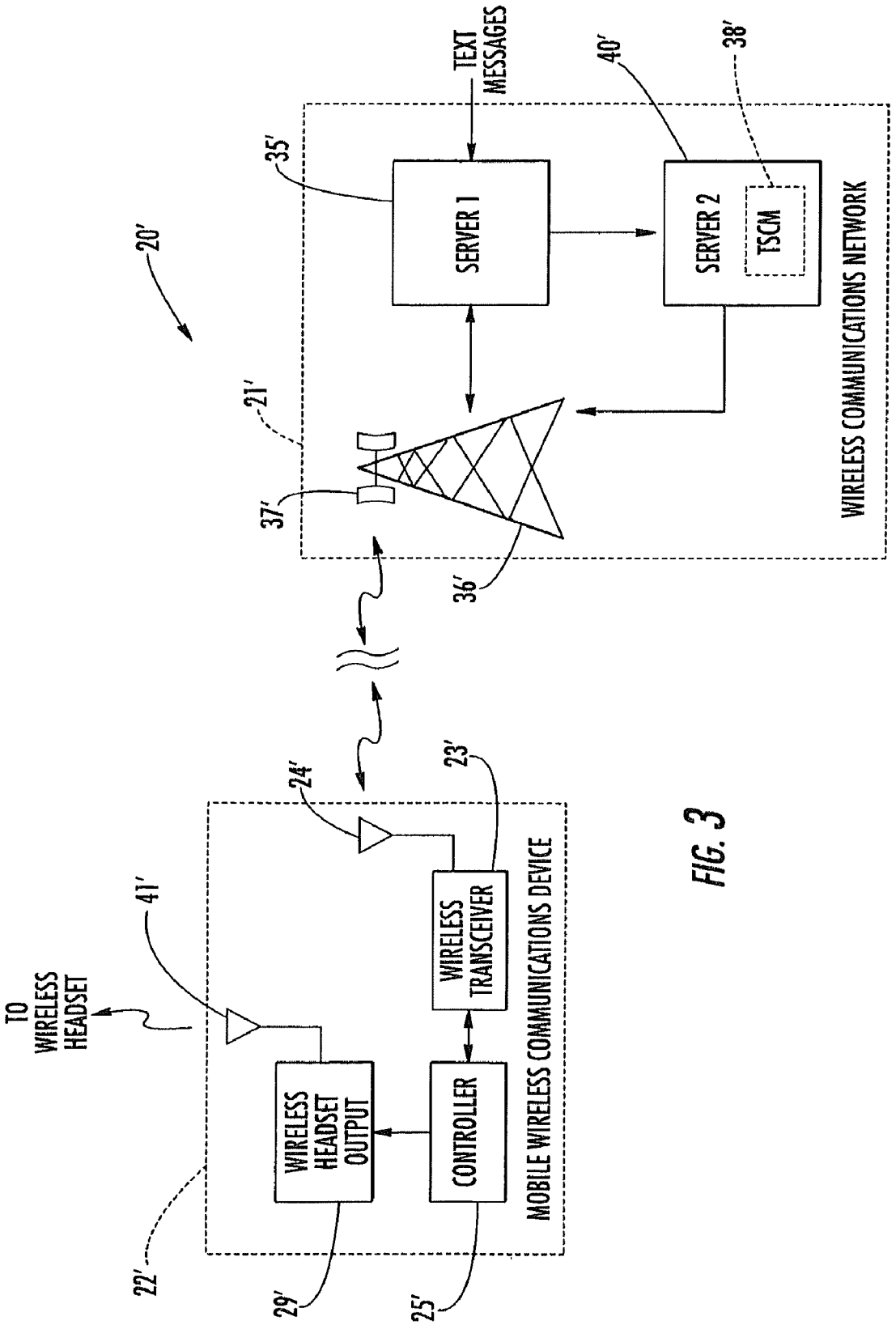
20'
TEXT MESSAGES
35'
40'
38'
SERVER 1
SERVER 2
TSCM
WIRELESS COMMUNICATIONS NETWORK
21'
37'
36'
24'
23'
41'
TO WIRELESS HEADSET
WIRELESS TRANSCEIVER
WIRELESS HEADSET OUTPUT
CONTROLLER
MOBILE WIRELESS COMMUNICATIONS DEVICE
22'
29'
25'

FIG. 3

28

AUDIO MODE FILTER

ENABLE AUTOMATIC AUDIO MODE? Y

AUDIO MODE OVERRIDE? N

PLEASE ENTER FILTER PARAMETER(S) FOR TEXT MESSAGES TO BE CONVERTED TO AUDIO MESSAGES (SPEECH):

FROM: "JOHN SMITH" OR "DAVID JONES"

KEYWORD(S): "URGENT" OR "IMPORTANT"

FIG. 4

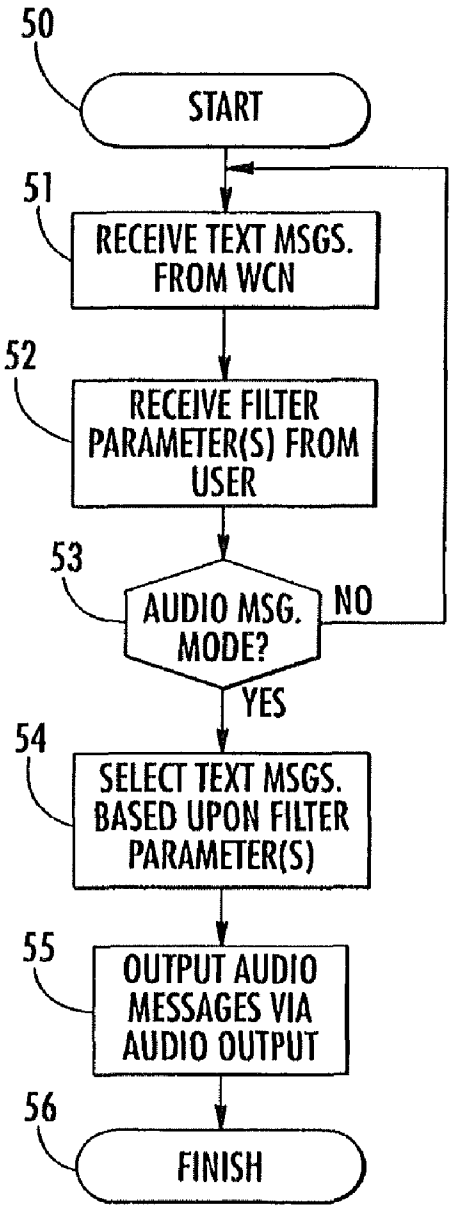
50
START
51
RECEIVE TEXT MSGS. FROM WCN
52
RECEIVE FILTER PARAMETER(S) FROM USER
53
AUDIO MSG. MODE?
NO
YES
54
SELECT TEXT MSGS. BASED UPON FILTER PARAMETER(S)
55
OUTPUT AUDIO MESSAGES VIA AUDIO OUTPUT
56
FINISH

FIG. 5

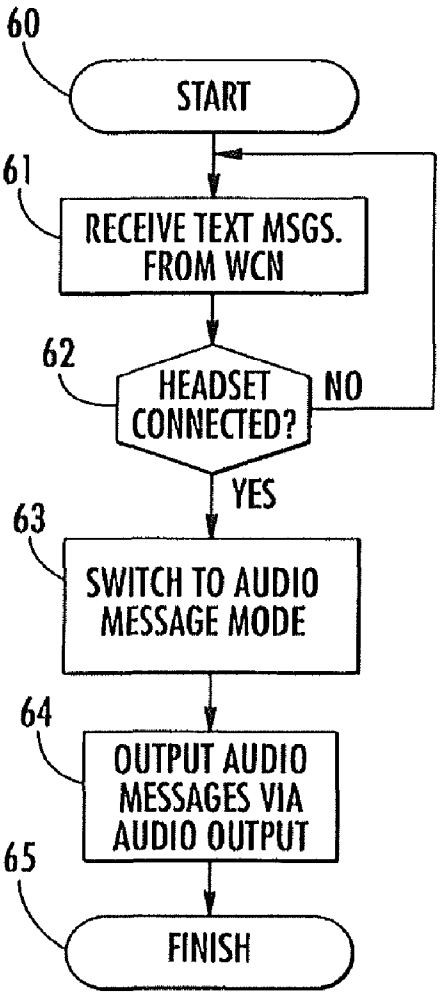
60
START
61
RECEIVE TEXT MSGS. FROM WCN
62
HEADSET CONNECTED?
NO
YES
63
SWITCH TO AUDIO MESSAGE MODE
64
OUTPUT AUDIO MESSAGES VIA AUDIO OUTPUT
65
FINISH

FIG. 6

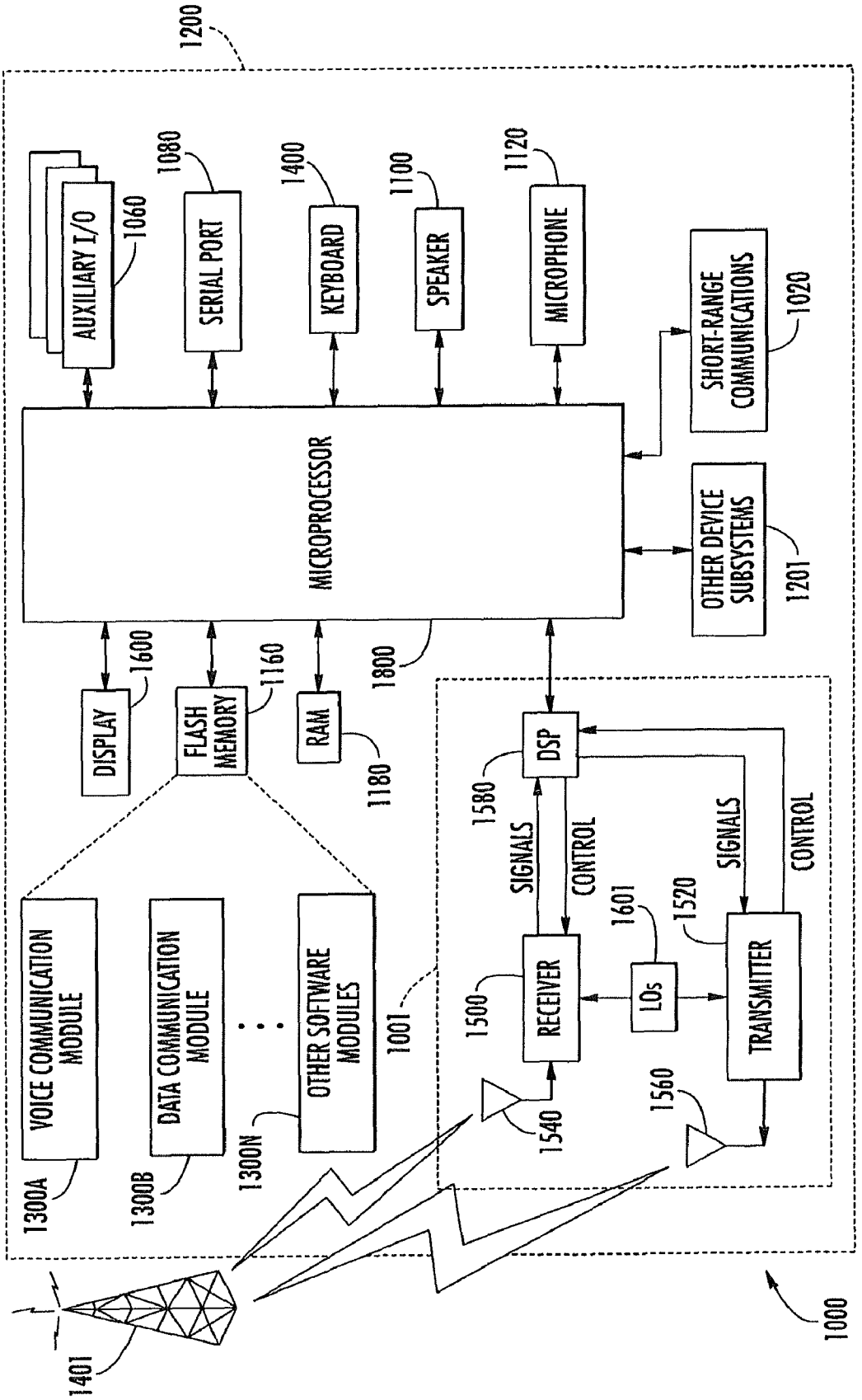
1200
AUXILIARY I/O
1060
SERIAL PORT
1080
KEYBOARD
1400
SPEAKER
1100
MICROPHONE
1120
SHORT-RANGE COMMUNICATIONS
1020
MICROPROCESSOR
OTHER DEVICE SUBSYSTEMS
1201
1800
DISPLAY
1600
FLASH MEMORY
1160
RAM
1180
DSP
1580
SIGNALS
CONTROL
SIGNALS
CONTROL
1601
1520
RECEIVER
1500
LOs
TRANSMITTER
1540
1560
VOICE COMMUNICATION MODULE
1300A
DATA COMMUNICATION MODULE
1300B
OTHER SOFTWARE MODULES
1300N
1001
1401
1000

FIG. 7

COMMUNICATIONS SYSTEM PROVIDING AUTOMATIC TEXT-TO-SPEECH CONVERSION FEATURES AND RELATED METHODS

RELATED APPLICATION

This application is a continuation of Ser. No. 10/790,479 filed Mar. 1, 2004 now U.S. Pat. No. 7,650,170, the entire disclosure of which is hereby incorporated herein by reference.

FIELD OF THE INVENTION

The present invention relates to the field of communications systems, and, more particularly, to wireless communications networks and related methods.

BACKGROUND OF THE INVENTION

Cellular telephone systems continue to grow in popularity and have become an integral part of both personal and business communications. Cellular phones allow users to place and receive telephone calls most anywhere they travel. Moreover, as cellular telephone technology has increased, so too has the functionality of cellular devices. For example, many cellular devices now incorporate personal digital assistant (PDA) features such as calendars, address books, task lists, etc. Moreover, such multi-function devices may also allow users to wirelessly access electronic mail (email) messages and the Internet via a cellular network.

Of course, cellular telephone usage can be problematic in some situations. In particular, many accidents have occurred because of drivers who become distracted while using their cellular phones. As a result, many drivers use hands-free headsets while driving, which allows the driver to maintain a normal driving posture and both hands on the wheel. Such headsets also allow users to more readily use their phones to place or receive calls while engaging in outdoor activities, such as jogging or bicycle riding, for example.

While headsets work well for telephone calls, they are typically of no value when it comes to accessing email messages on multi-function cellular telephone devices. That is, if a user needs to monitor his email messages while driving or jogging, for example, he still has to look at the display screen of his device to read email message text.

Various approaches have been developed for allowing users to more easily access email messages during such situations. For example, Copytalk, LLC provides a service called Listen and Reply, which uses a text-to-speech converter to convert emails to an audio format so that users can receive their email via telephone, much like a voice mail. Moreover, users may dictate replies over their phones, which are then converted to text email messages and sent to desired recipients. Audio notifications can be filtered by time or sender, and also can be turned on and off from the subscriber's phone.

Despite the advantages of such systems, users may desire greater functionality in some circumstances. Users with multi-function devices that receive text email messages may find it cumbersome to call a service provider whenever they wish to turn audio message delivery on or off. Moreover, users may wish to change their filter parameters fairly regularly or while they are away from their office.

SUMMARY OF THE INVENTION

In view of the foregoing background, it is therefore an object of the present invention to provide a communications

network that provides enhanced text-to-speech conversion and delivery features for text (i.e., email) messages and related methods.

This and other objects, features, and advantages in accordance with the present invention are provided by a communications system which may include at least one mobile wireless communications device, and a wireless communications network for sending text messages thereto. More particularly, the at least one mobile wireless communications device may include a wireless transceiver and a controller for cooperating therewith for receiving text messages from the wireless communications network. It may further include a headset output connected to the controller. The controller may be for switching between a normal message mode and an audio message mode based upon a connection between the headset output and a headset. Moreover, when in the audio message mode, the controller may output at least one audio message including speech generated from at least one of the received text messages via the headset output.

Accordingly, the mobile wireless communications device may automatically recognize when the user connects a headset to the headset output and enter the audio message mode based thereon. Thus, the user need not place a call to a message delivery system each time he wishes to turn the system on or off. Nor does the user have to remember to enable the service at his computer before leaving his office. Instead, the user may begin receiving audio messages simply be establishing a connection between his headset and the headset output.

To provide still further user convenience, the headset output may be a wireless headset output for establishing a wireless connection with the headset (e.g., a Bluetooth enabled headset). Of course, the headset output may be a headset jack for a wired headset as well. Moreover, the at least one wireless communications device may further include a user interface device, and the controller may switch to the audio message mode based upon an audio message mode command provided by a user via the user interface device. That is, the user may manually place the controller in the audio message mode, which may be advantageous when the user does not have his headset handy but still wishes to listen to audio messages instead of having to read the corresponding text messages.

To this end, the at least one wireless communications device may include a text-to-speech module for cooperating with the controller to convert the at least one text message to the at least one audio message. Alternately, the controller may generate a conversion request for the at least one text message and cooperate with the wireless transceiver to forward the conversion request to the wireless communications network. The wireless communications network may thus include a text-to-speech module for converting the at least one text message to the at least one audio message based upon the conversion request, and the wireless communications network may then send the at least one audio message to the at least one mobile wireless communications device.

In addition, the at least one mobile wireless communications device may further include a display connected to the controller for displaying the text messages. Also, the wireless communications network may be a cellular network, and the wireless transceiver may be a cellular transceiver, for example.

A method aspect of the invention is for using a mobile wireless communications device including a headset output. The method may include receiving text messages from a wireless communications network, and switching the mobile wireless communications device between a normal message mode and an audio message mode based upon a connection

between the headset output and a headset. Furthermore, when in the audio message mode, the mobile wireless communications device may output at least one audio message including speech generated from at least one received text message via the headset output.

A mobile wireless communications device, such as the one described briefly above, as well as a related computer-readable medium are also provided.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic block diagram generally illustrating a communications system in accordance with the present invention.

FIG. **2** is a schematic block diagram illustrating an embodiment of the communications system of FIG. **1** in greater detail.

FIG. **3** is a schematic block diagram illustrating another embodiment of the communications system of FIG. **1** in greater detail.

FIG. **4** is a front view of the display screen of the mobile wireless communications device illustrated in FIG. **1** illustrating audio message mode and filter parameter selection features of the present invention.

FIGS. **5** and **6** are flow diagrams illustrating communications method aspects of the present invention.

FIG. **7** is a schematic block diagram of an exemplary mobile wireless communications device suitable for use with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout, and prime notation is used to indicate similar elements in alternate embodiments.

Referring initially to FIGS. **1** and **2**, a communications system **20** in accordance with the present invention illustratively includes a wireless communications network **21** and one or more mobile wireless communications devices **22** for communicating therewith. In the illustrated example, the mobile wireless communications device **22** is a Blackberry device. However, it will be appreciated that numerous other types of wireless (e.g., cellular) devices may be used in accordance with the present invention as well. Moreover, while only a single device **22** is shown for clarity of illustration, it will further be appreciated that numerous mobile wireless communications devices may be used.

In particular, the mobile wireless communications device **22** illustratively includes a wireless transceiver **23** and associated antenna **24**, and a controller **25** connected to the wireless transceiver. By way of example, the controller **25** may be a microprocessor or other suitable control circuitry with associated memory, as will be discussed further with reference to Example 1, below.

The mobile wireless communications device **22** further illustratively includes a user interface device **39** connected to the controller **25**. Among other functions, the user interface device **39** allows a user to enter one or more audio message filter parameters, as will be described further below. In the case of the illustrated Blackberry device, the user interface device **39** includes a keypad **26** and/or a trackwheel **27**. Of course, other user interface devices **39** may be used as well, such as touch screens, etc., as will be appreciated by those skilled in the art. The mobile wireless communications device **22** also illustratively includes a display **28** and an audio output **29**, such as a headset output for a headset **30**, for example, both of which are connected to the controller **25**.

In the present example, the wireless communications network **21** is a cellular communications network which illustratively includes a server **35**, such as an electronic mail (email) server for receiving text messages for the user of the mobile wireless communications device **22**. Furthermore, a base station **36**, which is illustratively represented as a cellular tower, is connected to the server **35** and has an associated antenna **37** and transceiver (not shown), as will be appreciated by those skilled in the art. In the case of a cellular network, the wireless transceiver **23** of the mobile wireless communications device will correspondingly be a cellular transceiver. Various cellular formats and or protocols may be used in accordance with the present invention, as will be discussed further below.

The wireless communications network **21** may further include the appropriate switching and control circuitry for routing telephone calls to and from the mobile wireless communications device **22**, as will also be appreciated by those skilled in the art. However, this circuitry is not shown for clarity of illustration.

During normal operations, the server **35** receives text messages (e.g., email messages) for delivery to the mobile wireless communications device **22** via the Internet, for example, as will be appreciated by those skilled in the art. The server **35** then cooperates with the base station **36** to send the text messages to the mobile wireless communications device **22**, as will also be appreciated by those skilled in the art. The controller **25** similarly cooperates with the wireless transceiver **23** to receive the text messages from the wireless communications network **21**. Moreover, the controller **25** may then cause the display **28** to display an indication that new text messages have arrived, and/or display the messages themselves.

If the user is not otherwise preoccupied, he can turn his attention to the display **28** and use the keypad **26** and/or other input devices (e.g., trackwheel **27**, touch screen, etc.) to scroll through the message, forward the message, prepare a reply thereto, etc. On the other hand, if the user is engaged in an activity such as driving, jogging, etc., where it is inconvenient or impractical to focus attention on the display **28** and use the keypad **26**, the user may prefer that certain text messages be converted to speech and played for the user, similar to a voice mail message.

In accordance with the present invention, the user may provide one or more audio message filter parameters for filtering the text messages via the user interface device (i.e., the keypad **26** and/or trackwheel **27**). That is, the filter parameters are used by the controller **25** for "filtering" out the text messages that are to be converted to audio (i.e., speech) messages. By using the user interface device **39**, the user may quickly and easily set and change the audio message filter parameters, and may advantageously do so while away from his home or office computer.

As illustrated in FIG. **4**, various audio message filter parameters may be used. For example, one such parameter may be the name (e.g., "John Smith" or "David Jones") or other identifier (e.g., an email address or portions thereof) of the message sender. Another example would be one or more

keywords (e.g., "urgent" or "important") in the subject or body of the message. Various other filter parameters may be used as well, such as recipient information in a "cc" field, time/date, a message priority setting, etc., as will be appreciated by those skilled in the art.

Of course, while the user could provide no filter parameters and thus allow all text messages to be converted to speech, this will typically be undesirable. This is because a user will most likely not want to have "junk" email messages read to them, especially when they are driving or jogging, for example. Indeed, users will likely only want to receive important (e.g., from their boss, a client, etc.) or otherwise urgent messages while driving, exercising, etc., and leave more routine messages for a later time.

Another reason filter parameters are likely to be used relates to the embodiment illustrated in FIG. **3** (discussed further below) where audio message conversion is performed by the wireless communications network **21'**. In such case, a significant amount of airtime minutes could be used up by transmitting an audio file for each text message a user receives, as will be appreciated by those skilled in the art.

Once the controller **25** receives the audio message filter parameter(s) from the user, the parameter(s) is stored in a memory (see FIG. **7**) for later use when the controller is placed in the audio message mode. The controller **25** may be placed in the audio message mode in various ways. For example, the controller **25** may enter the audio message mode based upon a connection to the audio output **29**, such as if the audio output is a headset output and is connected to a headset **30**.

More specifically, the controller **25** may automatically detect this connection and enter the audio message mode, as will be appreciated by those skilled in the art. It should be noted that this connection may be a physical connection (i.e., in the case of wired headphones), or a wireless connection (i.e., in the case of wireless headphones), as will be discussed further below. Further, this automatic audio mode may be selectively turned on or off by the user via the user interface device **39** as shown in FIG. **4**. Because the controller **25** may advantageously enter the audio message mode whenever the user connects his headset **30** to the output **29**, the user does not have to remember to enable the audio message mode when leaving his office, or place a call to an audio message delivery system to disable or resume the audio message mode.

Additionally, a manual or override setting may also be used to place the controller **25** in the audio message mode indefinitely, whether a connection to the headset **30** is present or not. The override mode may be advantageous when the user is not carrying the headset **30**, but still wishes to have selected text messages converted to speech and read like a voice message, even if the user has to hold the mobile wireless communications device **22** to his ear. The user may quickly and conveniently turn the override and/or automatic audio modes on and off using the user interface **26**, as seen in FIG. **4**.

Various approaches may also be used for converting the selected text messages to audio messages. In the example illustrated in FIG. **2**, the mobile wireless communications device **22** illustratively includes a text-to-speech module **38** for cooperating with the controller **25** to convert the selected text messages to the audio messages. By way of example, the text-to-speech module **38** may be a software module that is run by the controller **25** when needed. Various text-to-speech conversion modules, which are known to those skilled in the art, may be used in accordance with the present invention.

Turning more specifically to FIG. **3**, an alternate approach for performing text-to-speech conversion is now described. In this exemplary embodiment, the text-to-speech module resides in the wireless communications network **21'**. Thus, instead of converting the text messages to speech at the mobile wireless communications device **22'**, the controller **25'** instead generates conversion requests for the selected text messages, and cooperates with the wireless transceiver **23'** to forward the conversion requests to the wireless communications network **21'**.

In the illustrated example, the text-to-speech conversion module **38'** is implemented on a dedicated text-to-speech conversion server **40'**. This approach may advantageously help prevent the workload of the email server **35'** from becoming unmanageable, as will be appreciated by those skilled in the art. However, it will also be appreciated that the email and speech conversion functions could be consolidated on a single server, or spread to more than two severs, depending upon the given implementation.

Generally speaking, the text-to-speech server **40'** may include the requisite text-to speech conversion software module **38'**, the appropriate telephony circuitry (not shown) for calling users and playing the audio messages, and an interface software module for interfacing the conversion software, telephony circuitry, and the email server **35'**, as will be appreciated by those skilled in the art. That is, once the email server **35'** learns that a particular text message is to be converted to speech, it may instruct the text-to-speech conversion server **40'** accordingly and hand the process over thereto, as the text-to-speech conversion server can perform the appropriate telephone connection operations to send the speech message to the user without further intervention or supervision.

Typically, the server **35'** will host a mailbox for storing a user's text (i.e., email) messages, which are retained for a certain period of time. For purposes of identifying the message stored in the mailbox that is to be converted to an audio format, the server **35'** may generate a unique identification thereof which is transmitted with the text message to the mobile wireless communications device **22'**. The controller **25** may then include the unique identification in the conversion request for the respective text message. Of course, various identifiers may be used for this purpose, such as the date and time the message is first received by the server **35** or sent to the mobile wireless communications device **22**, etc.

Once the selected text message has been converted to a speech message in an audio format, such as a .wav file, for example, the server **40'** cooperates with the base station **36'** to send the audio message to the mobile wireless communications device **22'**. The controller **25'** once again cooperates with the wireless transceiver **23'** for receiving the audio messages, and it outputs the audio messages via the output **29'**.

It should be noted that mobile wireless communications devices often include a subscriber identity modules (SIMs), which store the cellular telephone number assigned to the user, as well as other information (e.g., personal phone numbers, text messages, information used to support other services, etc.). As such, since SIMs may be interchanged between different devices, it may be desirable for the controller **25'** to provide the user's phone number stored in the SIM (if present) when establishing communications with the wireless communications network **21'**. This allows the server **40'** to maintain the correct phone number for the device at all times.

In the illustrated example, the output **29'** is a wireless headset output for communicating with a wireless headset and has an antenna **41'** associated therewith. By way of example, such a wireless headset output may be a Bluetooth enabled output, for example, although other wireless communication formats may also be used, as will be appreciated by

those skilled in the art. Of course, the output **29** may be a headset jack for a wired headset as well.

A first method aspect of the invention for using a mobile wireless communications device **22** including a user interface device **39** and an audio output **29** is now described with reference to FIG. **5**. As noted above, the mobile wireless communications device **22** (i.e., the controller **25**) is switchable between a normal message mode and an audio message mode. The method begins, at Block **50**, with the mobile wireless communications device **22** receiving text messages from a wireless communications network **21**, at Block **51**, and receiving at least one audio mode filter parameter from a user via the user interface device **39**, at Block **52**. Furthermore, when in the audio message mode (Block **53**), the mobile wireless communications device **22** selects received text messages based upon the at least one audio mode filter parameter, at Block **54**. Audio messages including speech generated from the selected text messages are then output via the audio output **29**, at Block **55**, as discussed further above, thus concluding the illustrated method (Block **56**).

Another method aspect of the invention for using a mobile wireless communications device **22'** including a headset output **29'** is now described with reference to FIG. **6**. The method begins (Block **60**) with receiving text messages from a wireless communications network **21'**, at Block **61**. The mobile wireless communications device **22'** switches between a normal message mode and an audio message mode based upon a connection between the headset output **29'** and a headset **30'**, at Block **62** and **63**, as described above. As also noted above, when in the audio message mode, the mobile wireless communications device outputs **22'** audio messages including speech generated from the received text messages via the headset output **29'**, at Block **64**, thus concluding the illustrated method.

The present invention will be further understood with reference to an exemplary implementation thereof using a Blackberry device, which is set forth in Example 1 below, as well as with reference to an exemplary Blackberry device, which is described further in Example 2 below.

Example 1

An executive is awaiting an email regarding an important issue from the CEO of his company. He sets an audio message filter parameter indicating that all emails from the CEO joe@somecompany.com will need to be provided via audio (i.e., speech). He commutes one hour to work everyday. Before he starts his commute he sets the device to be in the audio message mode, or the device automatically switches to this mode when he connects a headset (e.g., a Bluetooth enabled headset). Thirty minutes into the commute he receives an email from the CEO. The Blackberry Enterprise Server checks the device filters and sees that this email is subject to audio (i.e., speech) conversion and sends the request to a text-to-speech server.

This server looks up the phone number for the device, and converts the text of the email to speech in a .wav file. It then places a call to the device and plays the .wav file. The device can be set to have unique ring tones when an incoming call is from the text-to-speech server, for example. The user can configure the Blackberry to either have the device auto answer or use the headset to answer and listen to the email.

Example 2

Turning now additionally to FIG. **7**, an exemplary handheld mobile wireless communications device **1000** (i.e., a Blackberry device) that can be used in accordance with the present invention is now described. The device **1000** illustratively includes a housing **1200**, a keyboard **1400** and an output device **1600**. The output device shown is a display **1600**, which is preferably a full graphic LCD. Other types of output devices may alternatively be utilized. A processing device **1800** is contained within the housing **1200** and is coupled between the keyboard **1400** and the display **1600**. The processing device **1800** controls the operation of the display **1600**, as well as the overall operation of the mobile device **1000**, in response to actuation of keys on the keyboard **1400** by the user.

The housing **1200** may be elongated vertically, or may take on other sizes and shapes (including clamshell housing structures). The keyboard may include a mode selection key, or other hardware or software for switching between text entry and telephony entry.

In addition to the processing device **1800**, other parts of the mobile device **1000** include a communications subsystem **1001**; a short-range communications subsystem **1020**; the keyboard **1400** and the display **1600**, along with other input/output devices **1060**, **1080**, **1100** and **1120**; as well as memory devices **1160**, **1180** and various other device subsystems **1201**. The mobile device **1000** is preferably a two-way RF communications device having voice and data communications capabilities. In addition, the mobile device **1000** preferably has the capability to communicate with other computer systems via the Internet.

Operating system software executed by the processing device **1800** is preferably stored in a persistent store, such as the flash memory **1160**, 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 random access memory (RAM) **1180**. Communications signals received by the mobile device may also be stored in the RAM **1180**.

The processing device **1800**, in addition to its operating system functions, enables execution of software applications **1300**A-**1300**N on the device **1000**. A predetermined set of applications that control basic device operations, such as data and voice communications **1300**A and **1300**B, may be installed on the device **1000** 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 **1401**. Preferably, the PIM data items are seamlessly integrated, synchronized and updated via the wireless network **1401** 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 communications subsystem **1001**, and possibly through the short-range communications subsystem. The communications subsystem **1001** includes a receiver **1500**, a transmitter **1520**, and one or more antennas **1540** and **1560**. In addition, the communications subsystem **1001** also includes a processing module, such as a digital signal processor (DSP) **1580**, and local oscillators (LOs) **1601**. The specific design and implementation of the communications subsystem **1001** is dependent upon the communications network in which the mobile device **1000** is intended to operate. For example, a mobile device **1000** may include a communications subsystem **1001** designed to operate with the Mobitex™, Data TAC™ or

General Packet Radio Service (GPRS) mobile data communications networks, and also designed to operate with any of a variety of voice communications 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 **1000**.

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 **1000** may send and receive communications signals over the communication network **1401**. Signals received from the communications network **1401** by the antenna **1540** are routed to the receiver **1500**, 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 **1580** to perform more complex communications functions, such as demodulation and decoding. In a similar manner, signals to be transmitted to the network **1401** are processed (e.g. modulated and encoded) by the DSP **1580** and are then provided to the transmitter **1520** for digital to analog conversion, frequency up conversion, filtering, amplification and transmission to the communication network **1401** (or networks) via the antenna **1560**.

In addition to processing communications signals, the DSP **1580** provides for control of the receiver **1500** and the transmitter **1520**. For example, gains applied to communications signals in the receiver **1500** and transmitter **1520** may be adaptively controlled through automatic gain control algorithms implemented in the DSP **1580**.

In a data communications mode, a received signal, such as a text message or web page download, is processed by the communications subsystem **1001** and is input to the processing device **1800**. The received signal is then further processed by the processing device **1800** for an output to the display **1600**, or alternatively to some other auxiliary I/O device **1060**. A device user may also compose data items, such as e-mail messages, using the keyboard **1400** and/or some other auxiliary I/O device **1060**, such as a touchpad, a rocker switch, a thumb-wheel, or some other type of input device. The composed data items may then be transmitted over the communications network **1401** via the communications subsystem **1001**.

In a voice communications mode, overall operation of the device is substantially similar to the data communications mode, except that received signals are output to a speaker **1100**, and signals for transmission are generated by a microphone **1120**. Alternative voice or audio I/O subsystems, such as a voice message recording subsystem, may also be implemented on the device **1000**. In addition, the display **1600** may also be utilized in voice communications 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 enables communication between the mobile device **1000** 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™ communications module to provide for communication with similarly-enabled systems and devices.

Many modifications and other embodiments of the invention will come to the mind of one skilled in the art having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is understood that the invention is not to be limited to the specific embodiments disclosed, and that modifications and embodiments are intended to be included within the scope of the appended claims.

That which is claimed is:

1. A mobile wireless cellular communications device comprising:

a portable housing;

a headset;

a headset output carried by said portable housing and configured to establish a connection with said headset;

a wireless cellular transceiver carried by said portable housing; and

a controller carried by said portable housing and coupled to said wireless cellular transceiver and said headset output, said controller configured to

receive text messages from a wireless communications network,

switch between a normal message mode and a hands-free audio message mode based upon determining establishment of the connection between said headset output and said headset, and

when in the hands-free audio message mode, output at least one audio message comprising speech generated from at least one of the received text messages via said headset output to said headset.

2. The mobile wireless communications device of claim **1** wherein said headset comprises a wireless headset and said headset output comprises a wireless headset output.

3. The mobile wireless communications device of claim **1** wherein said headset comprises a wired headset and said headset output comprises a headset jack.

4. The mobile wireless communications device of claim **1** further comprising a user interface device carried by said portable housing and coupled to said controller; and wherein said controller is further configured to switch to the hands-free audio message mode based upon an audio message mode command provided via said user interface device.

5. The mobile wireless communications device of claim **4** wherein said user interface device comprises a keypad.

6. The mobile wireless communications device of claim **1** further comprising a text-to-speech module configured to convert the at least one text message to the at least one audio message.

7. The mobile wireless communications device of claim **1** further comprising a display carried by said portable housing and coupled to said controller for displaying the text messages.

8. A cellular communications system comprising:

at least one mobile wireless communications device comprising

a portable housing,

a headset,

a headset output carried by said portable housing and configured to establish a connection with said headset,

a wireless cellular transceiver carried by said portable housing, and

a controller carried by said portable housing and coupled to said wireless cellular transceiver and said headset output, said controller configured to

receive text messages from a wireless communications network,

switch between a normal message mode and a hands-free audio message mode based upon determining establishment of the connection between said headset output and said headset, and

when in the hands-free audio message mode, output at least one audio message comprising speech generated from at least one of the received text messages via said headset output to said headset; and

a wireless cellular communications network configured to send the text messages to said at least one mobile wireless communications device.

9. The communications system of claim **8** wherein said headset comprises a wireless headset and said headset output comprises a wireless headset output.

10. The communications system of claim **8** wherein said headset comprises a wired headset and said headset output comprises a headset jack.

11. The communications system of claim **8** further comprising a user interface device carried by said portable housing and coupled to said controller; and wherein said controller is further configured to switch to the hands-free audio message mode based upon an audio message mode command provided via said user interface device.

12. The communications system of claim **8** further comprising a text-to-speech module configured to convert the at least one text message to the at least one audio message.

13. The communications system of claim **8** wherein said controller is also configured to generate a conversion request for the at least one text message and to cooperate with said wireless cellular transceiver to forward the conversion request to said wireless communications network; and wherein said wireless communications network is configured to receive the conversion request and further comprises a text-to-speech module for converting the at least one text message to the at least one audio message, and wherein said wireless communications network is also configured to send the at least one audio message to said at least one wireless communications device.

14. The communications system of claim **8** further comprising a display carried by said portable housing and coupled to said controller for displaying the text messages.

15. A method for using a mobile wireless cellular communications device comprising a headset output, the method comprising:

receiving text messages from a wireless cellular communications network using the mobile wireless communications device;

switching the mobile wireless cellular communications device between a normal message mode and a hands-free audio message mode based upon determining establishment of a connection between the headset output and a headset; and

when the mobile wireless cellular communications device is in the hands-free audio message mode, outputting at least one audio message comprising speech generated from at least one received text message via the headset output to the headset.

16. The method of claim **15** wherein the headset output comprises a wireless headset output for establishing a wireless connection with the headset.

17. The method of claim **15** wherein the mobile wireless cellular communications device further comprises a user interface device connected to the controller; and further comprising switching to the hands-free audio message mode based upon an audio message mode command provided via the user interface device.

18. The method of claim **15** further comprising converting the at least one text message to the at least one audio message prior to outputting.

19. A non-transitory computer-readable medium for use with a mobile wireless cellular communications device comprising a headset output, the computer-readable medium having computer-executable instructions for causing the mobile wireless communications cellular device to perform steps comprising:

receiving text messages from a wireless cellular communications network;

switching between a normal message mode and a hands-free audio message mode based upon determining establishment of a connection between the headset output and a headset; and

when in the hands-free audio message mode, outputting at least one audio message comprising speech generated from at least one received text message via the headset output to the headset.

20. The non-transitory computer-readable medium of claim **19** wherein the headset output comprises a wireless headset output for establishing a wireless connection with the headset.

21. The non-transitory computer-readable medium of claim **19** wherein the mobile wireless cellular communications device further comprises a user interface device connected to the controller; and further comprising computer-executable instructions for causing the mobile wireless communications device to perform a step comprising switching to the hands-free audio message mode based upon an audio message mode command provided via the user interface device.

22. The non-transitory computer-readable medium of claim **19** further comprising computer-executable instructions for causing the mobile wireless cellular communications device to perform a step of converting the at least one text message to the at least one audio message prior to outputting.

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