

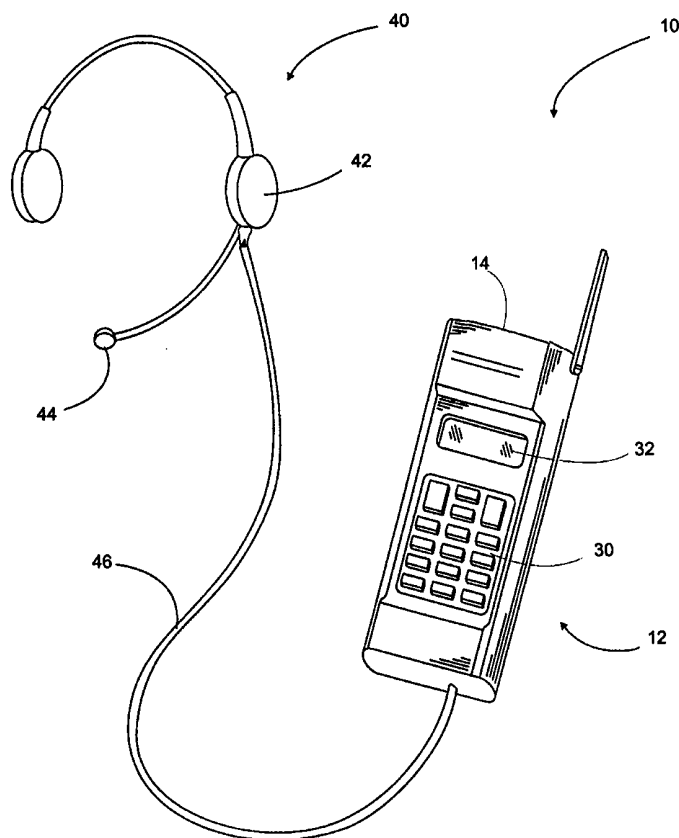
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(54) Title: CELLULAR PHONE WITH EXPANSION MEMORY FOR AUDIO AND VIDEO STORAGE

(57) Abstract

A cellular telephone includes an internally integrated digital entertainment module. The telephone includes a transceiver unit and a headset which is connected to the transceiver unit by wired or wireless link. The entertainment module includes an interchangeable ROM and/or expansion RAM for storing music or other audio signals for playback through the telephone's headset. Music or other audio signals in digitized form is stored in the interchangeable ROM or is loaded into the expansion RAM from a CD player, computer, or other source of digitized audio signals. Under control of the cellular telephone's microprocessor, the digitally stored audio signal is played back through the telephone's headset. The entertainment module may be located in the transceiver unit, a removable battery pack, or in a separate adapter.



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CELLULAR PHONE WITH EXPANSION MEMORY FOR AUDIO AND VIDEO STORAGE

FIELD OF THE INVENTION

The present invention relates generally to mobile communication devices, and more particularly to portable radio communication devices having an integral entertainment module including RAM or ROM for storing audio, video and/or still images.

BACKGROUND OF THE INVENTION

In the past two decades, advances in digital electronic technology have led to a rapid growth in the area of entertainment oriented consumer electronic devices. In particular, portable electronic devices such as audio CD players, FM/AM radio receivers, and even television or video tape/disc players have become increasingly popular among consumers as they have become small, lightweight, and easy for an individual to carry.

While quite popular with consumers, the mass storage type devices (audio CD, video tape/disc) typically suffer from motion induced distortion otherwise known as bouncing or skipping. These problems arise, in part, as a result of the required motion of the mass storage medium during normal operation. That is, in the case of an audio CD or a video disc, the disc which comprises the storage medium is typically spun or rotated at a relatively high speed while the information stored on the disc is read by an associated read head. Proper and precise alignment of the read head with respect to the spinning storage medium must be maintained at all times in order to insure error free reading of the stored data. Such precise alignment is often difficult to maintain when the audio or video player is being used in manner which is conducive to extreme vibration or mechanical shock. In practice, mechanically harsh

activities such as jogging or running are common among users of portable electronics, particularly with regard to the use of portable audio CD players. In such cases, skipping or bouncing artifacts induced in the CD player can seriously impair the overall performance of the player.

With further regard to the recreational athletic activities of portable electronics consumers, it is often the case such consumers will carry not only an audio CD player for entertainment purposes, but also a cellular telephone for safety and security. Although such equipment provides the desired entertainment/security services to the athletically active consumer, the need to carry multiple pieces of equipment is generally viewed as inhibiting or impairing to their athletic endeavors.

Therefore, there is and continues to be a need for a practical and efficient technique for incorporating the functionality of audio and/or video playing devices within wireless communications devices such as cellular telephones.

SUMMARY OF THE INVENTION

The present invention is a cellular telephone particularly adapted for leisure activities. The cellular telephone of the present invention includes a portable transceiver unit and a headset which can be worn by the user during leisure activities such as jogging, biking, gardening, etc. The transceiver unit includes a fully functional transceiver capable of sending and receiving voice and data signals via an RF carrier. The transceiver unit has an integral digital entertainment module including a memory for storing music or other audio signals for playback through the headset. For purposes of this application, memory means all forms of computer memory but does not include disk storage, tape storage or other memory requiring electromechanical read systems. The memory may be in the form of a removable ROM cartridge and/or an expansion RAM. In those embodiments having an

expansion RAM, an input port is provided for loading music or other audio signals into the expansion RAM from a CD player, computer, or other source of digitized audio.

Under the control of the transceiver unit's microprocessor, the digitally stored audio signal is played out through the telephone's headset, which in the preferred embodiment comprises stereo headphones. The headset may be connected to the phone by a wired or wireless link. Because of its integration into the cellular phone, the digital entertainment module can share components already present in the cellular phone. Such savings would not be available if a CD player were simply aggregated with the phone. Further, the use of solid state RAM or ROM, as opposed to disc storage, eliminates the need for bounce control circuitry. This enables the disclosed invention to provide cellular communications and entertainment during leisure activities.

In another aspect of the present invention, the digital entertainment module could be located in a removable battery pack which attaches to the transceiver unit, or in a separate adapter which plugs into the transceiver unit. Locating the digital entertainment module in either a battery pack or separate adapter allows the manufacturer to offer the digital entertainment module as an optional accessory which does not need to be purchased at the same time the cellular phone is purchased. This allows consumers who purchase a phone without the digital entertainment module to later purchase the battery pack or adapter as an upgrade to the existing phone.

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