



US006631098B2

(12) **United States Patent**
Chang et al.

(10) **Patent No.:** **US 6,631,098 B2**
(45) **Date of Patent:** **Oct. 7, 2003**

(54) **DUAL-MODE MP3 PLAYER** 6,252,830 B1 * 6/2001 Hsu 369/25
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Wen-Hwa Chou, Taipei (TW) 6,316,912 B1 * 11/2001 Murphy 320/114

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* cited by examiner

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 165 days.

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(21) Appl. No.: **09/895,166**

(22) Filed: **Jul. 2, 2001**

(65) **Prior Publication Data**

US 2003/0002395 A1 Jan. 2, 2003

(51) **Int. Cl.**⁷ **H04H 9/00**

(52) **U.S. Cl.** **369/7; 369/2; 369/21**

(58) **Field of Search** 369/2, 6, 7, 1,
369/10–12, 25, 21, 4, 20, 22, 19; 320/114;
360/72.2, 7

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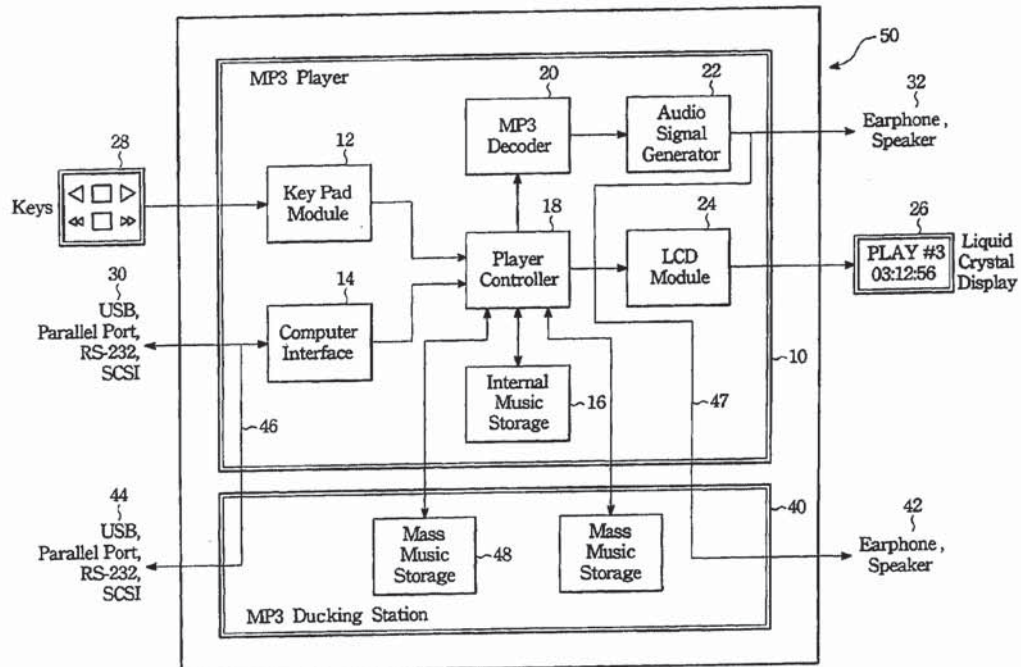
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(57) **ABSTRACT**

“A portable MP3 player has two operation modes. In a first mode, the portable MP3 player operates independently. A controller in the MP3 player reads first MP3 files from internal memory and a MP3 decoder is utilized for decoding the MP3 files. In addition, the audio data are output to an earphone or a speaker. In a second mode, a ducking station is provided for placing the portable MP3 player, which has an extended memory device, e.g. CD-ROM, for storing second MP3 files. The controller of the portable MP3 player accesses the second MP3 files via interfaces that are connected when the portable MP3 player is placed on the ducking station. The MP3 decoder of the portable player is also utilized to decode the second MP3 files and the corresponding audio data are output through the ducking station.”

5 Claims, 3 Drawing Sheets



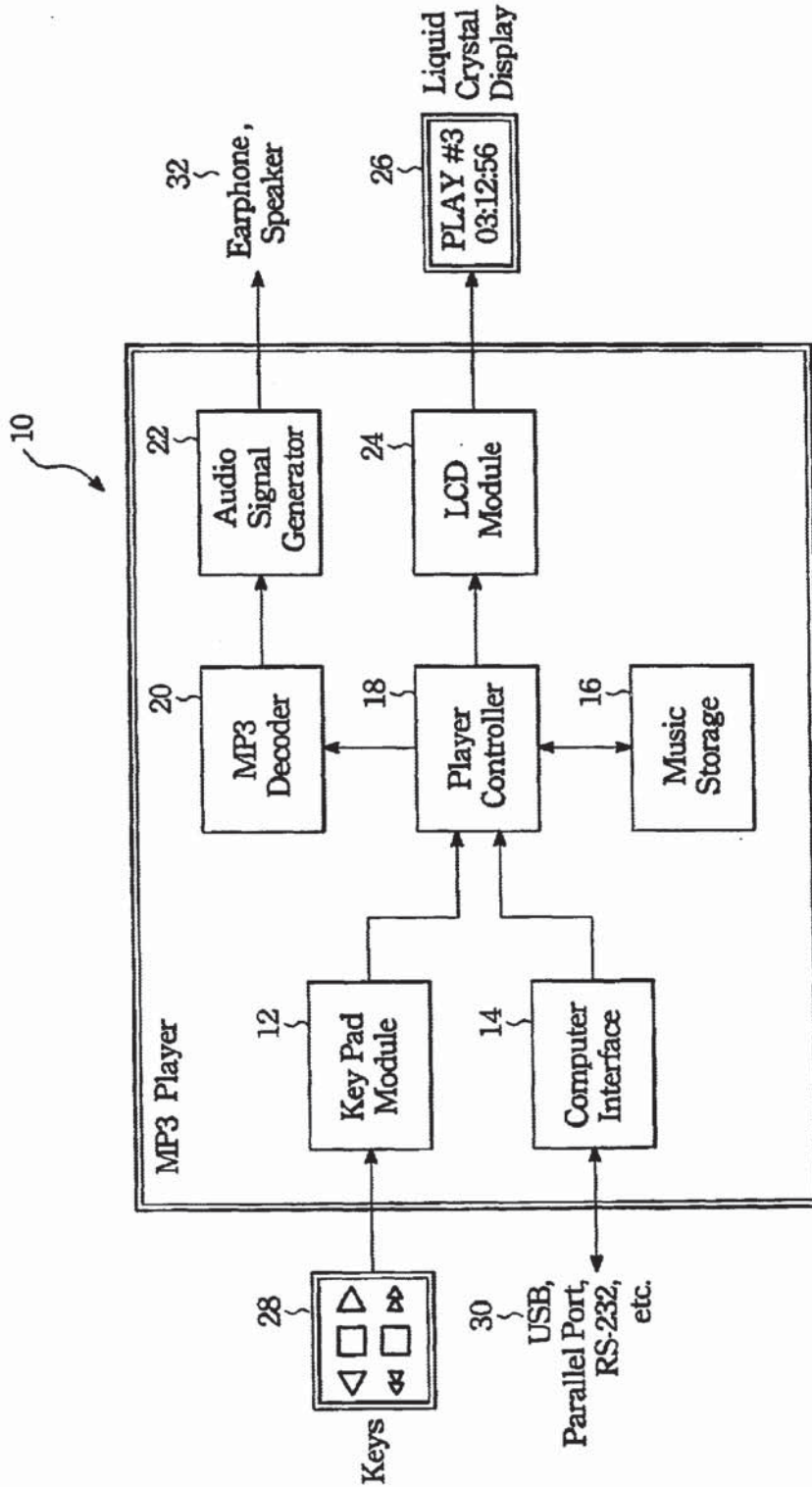


Fig.1
(Prior Art)

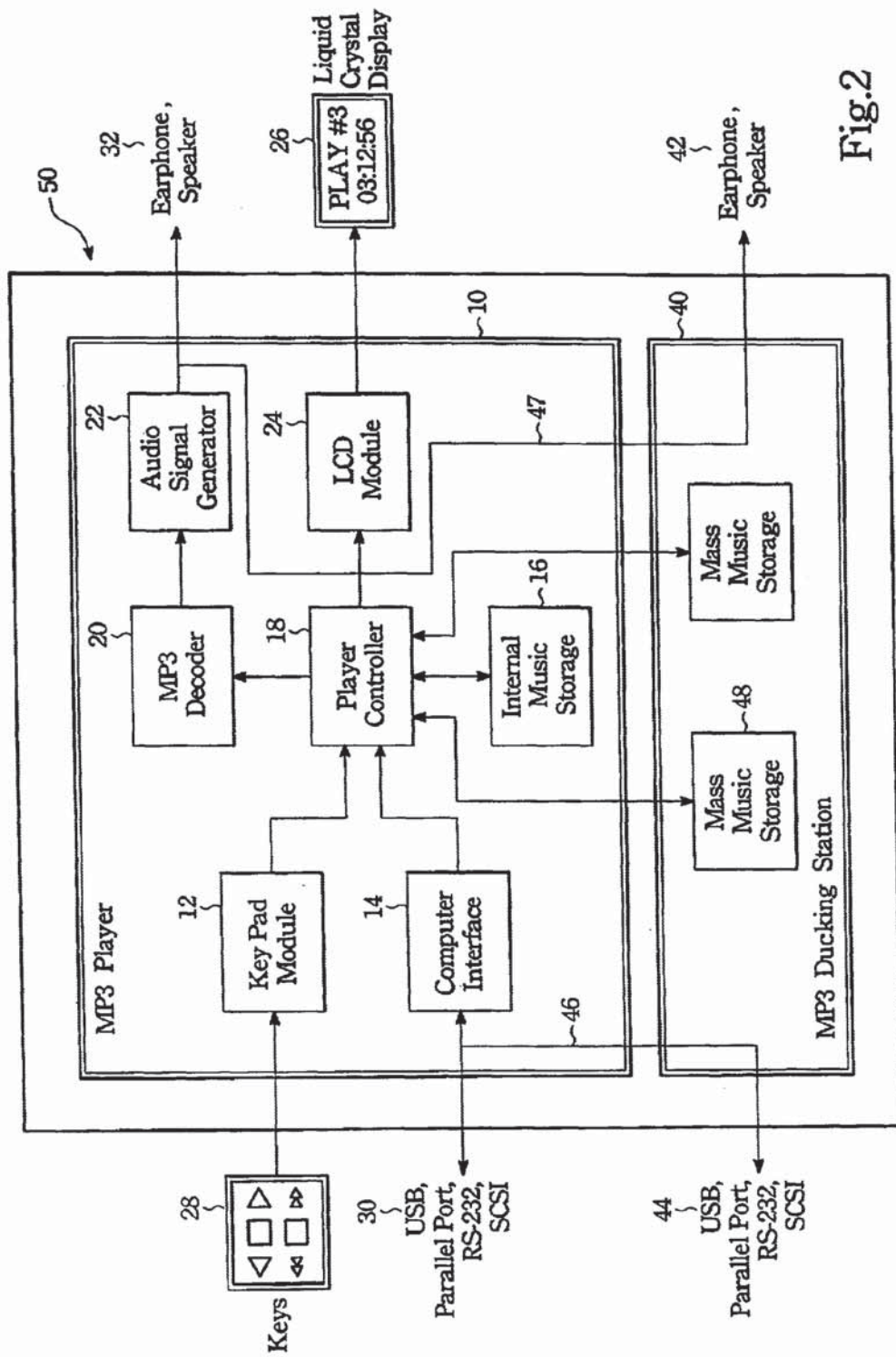
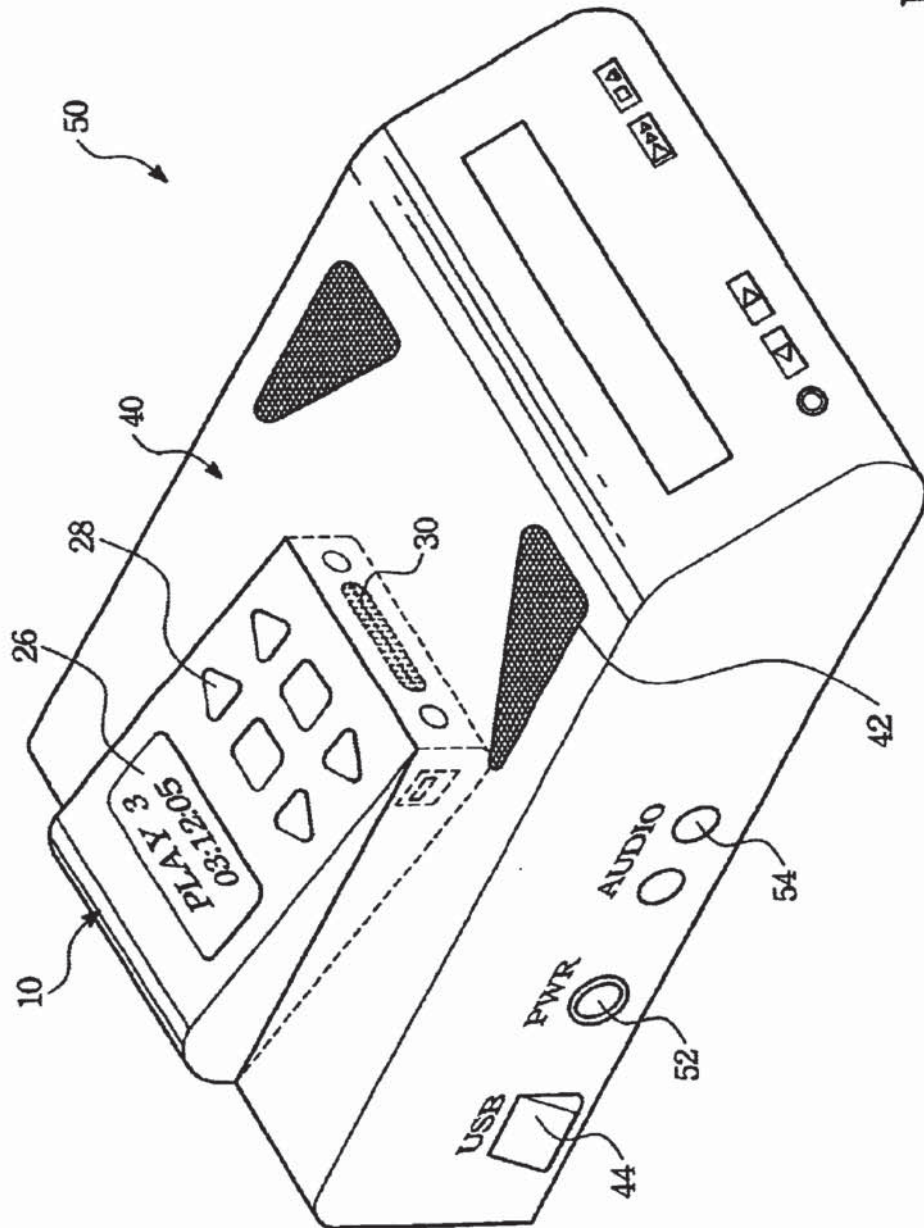


Fig.2

Fig.3



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DUAL-MODE MP3 PLAYER**BACKGROUND OF THE INVENTION****1. Field of the Invention**

The present invention relates to an MP3 player device, more particularly, to an MP3 player with large storage.

2. Description of the Prior Art

Developments of all assortments of audio players and storage for audio data are progressing up date owing to the need of human kinds for audio storing. Especially under the drive of the needs for audio devices of the Internet and multimedia, efforts are further made to audio players and storage for audio data to make them with higher quality, higher stored capacity, and more convenient for use. The storage for audio data and audio players in the market are in sequence a phonograph disk and a phonograph player, a magnetic recorded tape and a magnetic recorders, a compact disk (CD) and a CD-ROM, a digital versatile disk (DVD) and a DVD ROM, and flash ROM and an MP3 player.

Magnetic recorded tapes are not able to be sustained for a long time, and are easy to be demagnetized by ultra-violet ray, plus their small capacities and being sensitive to noise signals which make the magnetic recorded tapes gradually decline on the market. In a CD-ROM, a laser light incidents a compact disk and reflexes back to an optical pickup head through the disk with audio data molded in. The reflex optical signals and thus the audio signals are digital, and which considerably make the signals themselves immune to noise, and thereby high audio quality is achieved. The disk is easy to conserve, with high capacity, low in cost, immune to interference of noise; which make the storage itself and the associated player extremely popular on the market and cut the first edge.

An MP3 player is much easier to use for music listening. The audio data are specifically compressed and stored in a semiconductor memory, such as ROM, EPROM and flash ROM. Although an MP3 player is small in dimension, easy to carry, the memory it uses costs very high as compared to compact disks. Generally, the size of the memory used for an MP3 player is 16 MB, and which is corresponding to a 15-minute period of length. To update the data in a small-sized memory for an MP3 player, a computer is needed to do write or rewrite audio data to the MP3 player. To increase the capacity of a memory of an MP3 player, added-on cards can be inserted into the player, but the cost needed is just sharply risen.

Consequently, a small-sized, light, capacious, easy-used, and low-priced storing device for audio data and a player has become the goal of the researchers' and users'. MP3 players have received widely popularity since its open to the market. If the bottleneck for small storing space on MP3 players has a breakthrough, then MP3 players will be provided with all advantages as mentioned above. For that reason, how to improve MP3 players has drawn much attention from the insiders and symbolized the progress of audio processes in electronic industry.

SUMMARY OF THE INVENTION

In view of the shortcoming a conventional MP3 player suffers, the present invention suggests a combined MP3 player machine with a large memory that can be accessed by the controller of the MP3 player.

In this invention, compact disks (recordable compact disk, re-writable compact disk, hard disk) are utilized as the

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memory and a CD-ROM (CD-R, CD/RW, Hard disk, etc.) is positioned as the ducking station of the MP3 player by use of combining the MP3 player and the CD-ROM. The CD-ROM is self-powered, and thus separated from a computer. The MP3 player is fabricated on the CD-ROM and can be independent and detachable from the CD-ROM. When they connect together, audio data can transmit to the MP3 player from the CD-ROM through the interface between them; such as USB, EPP, SCSI, IDE, and the like; and capacious storage is well provided. When the combined machine is connected to a computer through an interface, the MP3 player can be programmed through the USB (RS232, EPP, SCSI, IDE, etc.) interface of the CD-ROM, since the USB (RS232, EPP, SCSI, IDE, etc.) port of the MP3 player is locked and bypassed to the USB (RS232, EPP, SCSI, IDE, etc.) port of the CD-ROM. When the combined machine plays, the audio signal of the MP3 to the earphone or speaker is locked and bypassed to the earphone or speaker of the CD-ROM. When the MP3 player is extracted from the combined machine, it can be a player itself. The consumer, the combined MP3 player with a large memory, and the computer are well integrated, and the capacious memory for the MP3 player is perfectly achieved by bridging over the MP3 player and the compact disks.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be more clearly understood, it will now be disclosed in greater detail when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is the function block of the MP3 player of the prior art.

FIG. 2 is the function block of the combined machine according to the present invention.

FIG. 3 is the left-sided elevated view of the profile of the combined machine according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

To settle the limited memory issue on a conventional MP3 player, the present invention provides herein a large memory for the MP3 player without needing high cost.

Referring to FIG. 1, which depicts a function block of the MP3 player used in prior arts. The audio data storage 16 is typically flesh ROM (ROM, or EPROM is allowed also), and with a size of 16 MB, which is unsatisfied for current use. With the use of an external memory card (not shown for simplicity), the cost may be very high and thus not practicable. Furthermore, when updating new music or audio data for the MP3 player 10, a connection with a computer is needed. In the prior art, the computer can program the internal storage 16 through the interface port 30 to the computer interface 14 in the MP3 player 10. Since the MP3 audio data is specifically compressed, the audio data fetched from the storage 16 by the player controller 18 is fed into the MP3 decoder 20 for decoding. The decoded audio data are then fed into the audio signal generator 22, and then outputted to the earphone or speaker 32.

In this invention, an MP3 ducking station is combined with the MP3 player in prior arts to obtain a combined machine (shown in FIG. 2) with a large memory. For the profile of the combined machine, see FIG. 3. The ducking station 40 is located below the MP3 player 10, and they jointly form a combined machine 50. The combined machine 50 is self powered or can be optionally powered by

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