A PORTABLE OR HAND-HELD AUDIOVISUAL DEVICE WITH SWAPPABLE FUNCTIONAL MODULES

FIELD OF INVENTION

The present invention is in the field of portable electronic multimedia devices such as notebook personal computers, telecommunication sets, television sets, video players/recorders, gaming consoles and hand-held devices. In particular, the present invention relates to a portable or hand-held battery-powered audiovisual device which is used to interchangeably connect to each of the different swappable functional modules designed for the said audiovisual device.



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BACKGROUND OF THE INVENTION & PRESENT STATE OF THE ART

The growth in the consumer electronic multimedia industry had been tremendous and is mainly fueled by consumer demands for portability, innovation and cost. Increasingly, more and more electronic multimedia devices like notebook personal computers, telecommunication sets, TV/video players/recorders and hand-held gaming consoles incorporate dedicated color flat-panel LCD or LED screens. Except for the notebook personal computers, the screens in the other electronic multimedia devices tend to be small due to the high cost of the color flat-panel screens.

The average consumer tends to have one or more electronic multimedia devices. However, the average daily usage of each of these electronic multimedia devices is low and therefore there is a lot of "down time" or unproductive time for these devices, especially for the color flat-panel screens.

In the area of notebook personal computers, the cost and multi-functionality are the main competitive factors. The notebook personal computer is widely used as a video or music player despite its inefficiency or underutilization in doing so. Farrow, Timothy Samuel et al. (US patent application 20030063059 dated Apr 3, 2003) envisage a method and apparatus for using or re-using the expensive flat-panel LCD screen of a personal computer as the life of such LCD screen tends to outlive the usefulness of the personal computer. One can be very certain that if the cost of the notebook personal computer is substantially reduced or more functions can be packed into the notebook personal computer, there will be a surge in the demand for such notebook personal computers.

OBJECTS OF THE INVENTION

It is an object of the present invention to create a portable or hand-held battery-powered audiovisual device which is used to interchangeably connect to each of the different swappable functional modules designed for the said audiovisual device.

It is another object of the present invention to create a new range of portable electronic multimedia devices (like notebook personal computers, telecommunication sets, video players/recorders, television sets, gaming consoles etc.) without a separate and dedicated audiovisual and battery system, thereby reducing the cost of such portable electronic multimedia devices.

It is also another object of the present invention to create a new range of portable electronic multimedia devices with a detachable audiovisual and battery system.

It is also yet another object of the present invention to create a new range of portable electronic multimedia devices to speed up the convergence of the notebook personal computers with other multimedia entertainment devices and to increase the demand for such "converged" devices.

SUMMARY OF THE PRESENT INVENTION

The present invention relates to a portable or hand-held battery-powered audiovisual device which is used to interchangeably connect to each of the different swappable functional modules designed for the said audiovisual device. The present invention will create a new range of portable electronic multimedia devices which are cheaper and more cost-effective for the consumers as there is no need for a separate dedicated battery and audiovisual system for each of the portable electronic multimedia devices.

The portable or hand-held audiovisual device has a lightweight body complete with the following :-

- a docking system to interchangeably connect the audiovisual device to the individual swappable functional modules which will then perform the same functions as the present portable electronic multimedia device with separate and dedicated audiovisual and battery systems such as the mobile phones, notebook personal computers, TV/radio tuners, video players/recorders, gaming consoles and hand-held devices.
- control/processing circuitry and connections for audio, video and power inputs and outputs. The audio and video inputs/outputs cater for the normal analogue and digital signals.
- a battery system with an external battery charger which is detachable from the battery system.
- a flat-panel electronic display screen such as a LCD screen.
- a pair of audio speakers.

Besides the creation of the swappable functional modules for the portable audiovisual device, the present invention also encompasses a new range of consumer electronic multimedia devices (such as notebook PCs, mobile phones, TV/radio tuners, video players/recorders, gaming consoles) with a detachable section containing the flat-panel display screen, audio speakers and battery.

BRIEF DESCRIPTION OF THE DRAWINGS

The advantages and objects of the present invention are summarized but not limited to the following drawings, the full scope of which are embodied in the appended claims of the present invention :-

FIG. 1 shows a simplified block diagram of the control/power circuitry of a typical electronic multimedia device which can be divided into two detachable sections.

FIG. 2 shows the perspective view of a portable audiovisual device of the present invention with a swappable functional module.

FIG. 3 shows the perspective view of a hand-held audiovisual device of the present invention with a swappable functional module.

DETAILED DESCRIPTION OF THE EMBODIMENTS OF THE INVENTION

The present invention relates to a portable or hand-held battery-powered audiovisual device which is used to interchangeably connect to each of the different swappable functional modules designed for the said audiovisual device. Besides the creation of the swappable functional modules for the portable audiovisual device, the present invention also encompasses a new range of consumer electronic multimedia devices (such as notebook PCs, mobile phones, TV tuners, video players/recorders) with a detachable section containing the flat-panel display screen, speakers and battery.

A person skilled in the area of designing and manufacturing electronic multimedia devices will be able to design and manufacture the devices covered by the present invention without much difficulty or additional proprietary information.

FIG. 1 shows a simplified block diagram of the control/power circuitry **1** of a typical electronic multimedia device which can be divided into two detachable sections **2** and **3**. The detachable section **2** consisting of the battery **10**, flat-panel liquid crystal display (LCD) screen **8**, audio speakers **9** and control circuitry **12** will be housed in the portable or handheld audiovisual device of the present invention. The other detachable section **3** consisting of the central processing unit **4**, input/output interface **5** and internal input/output device **6** will be housed in a swappable functional module of the present invention. An external input/output device **7** can be connected to the detachable section **3**. The battery **10** is connected to a removable battery charger **11**.

The two detachable sections **2**, **3** can be docked together physically and then connected electrically through their respective matching connections **15**, **13** for the battery power and **16**, **14** for the audiovisual signals.

The detachable section **3** which forms the swappable functional module can be designed to operate a dedicated function or a combination of functions such as telecommunication, personal computing, television/radio reception, data processing, audio/video processing, electronic gaming, multimedia entertainment and information technology.

FIG. 2 shows the perspective view **17** of a portable audiovisual device **18** of the present invention with a swappable functional module **19**. The portable audiovisual device **18** houses a flat-panel LCD screen **20**, a control panel **21**, a pair of audio speakers **22** and **23**, battery pack **24**, connection ports **26** for battery power and connection ports **27** for audiovisual signals. The external battery charger **25** can be connected and disconnected from the battery pack **24**. The swappable functional module **19** is docked to the portable audiovisual device **18** through guide-pins **28, 29** and locking latch **30**. Hinges **31, 32** can be added to facilitate the repositioning of the screen **20**.

FIG. 3 shows the perspective view **33** of a hand-held audiovisual device **34** of the present invention with a swappable functional module **39** which is snapped onto the back of the hand-held audiovisual device **34**. The hand-held audiovisual device **34** houses a flat-panel screen **35**, a pair of audio speakers **36, 37** and control switches **38**. The battery, battery charger and docking mechanism are not shown.

From the above illustrations, in addition to the swappable function modules, one can also easily modify the existing electronic multimedia devices to include a detachable section housing the flat-panel screen, speakers and battery.

CLAIMS:

What is claimed is:-

1. A portable or hand-held audiovisual device which is used to interchangeably connect to each of the different swappable functional modules designed for the said audiovisual device and having a lightweight body containing:-
   - at least one docking system for physically and electrically connecting the said audiovisual device interchangeably to each of the said swappable functional modules.
   - at least one rechargeable battery with a removable connection to an external battery charger
   - a flat-panel electronic display screen
   - at least one audio speaker
   - control/processing circuitry for said audiovisual device
   - control/processing circuitry and connection ports for audiovisual signal and power inputs and outputs.

2. The said audiovisual device in **Claim 1** whereby each of the said different swappable functional modules contains means to operate a separate function or a combination of functions such as telecommunication, personal computing, television/radio reception, data storage/processing/transfer, audio/video/image capture/processing/storage, electronic gaming, multimedia entertainment, wireless communication and information technology.

3. The said audiovisual device in **Claim 1** whereby the said flat-panel electronic display screen can be a LCD, LED or plasma screen.

4. The said audiovisual device in **Claim 1** whereby the said docking system can be a separate or a combination of snap-on, slide-on, hinged or insertion mechanism.

5. A portable or hand-held electronic multimedia device with a detachable section housing the flat-panel electronic display screen, audio speakers and battery.

6. The said electronic multimedia device in **Claim 5** whereby the said electronic multimedia device contains means to operate a separate function or a combination of functions such as telecommunication, personal computing, television/radio reception, data storage/processing/transfer, audio/video/image capture/processing/storage, electronic gaming, multimedia entertainment, wireless communication and information technology.

7. The said electronic multimedia device in **Claim 5** whereby the said flat-panel electronic display screen can be a LCD, LED or plasma screen.