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Video #4342-V/13

FJC Online
the Federal Judicial Center's website on the federal courts' intranet, at http://fjconline.fjc.dcn/

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(54) **VERSATILE WRISTWATCH SYSTEM**

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G06F 07/02 (2006.01)

(52) **U.S. Cl.**
USPC …..... **714/776;** 297/452

(58) **Field of Classification Search** …..... 714/776, 714/775

See application file for complete search history.

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Primary Examiner – Benita Millman

(57) **ABSTRACT**

A wristwatch system is provided having a piezoelectric crystal and a microcontroller, along with a software-defined radio and a digital signal processor. Communicatively coupled with the microcontroller are input/output devices including a touchscreen display and a microphone and speaker. Together with suitable software, the system provides not only a time-of-day display but also a two-way wrist radio transceiver, a television receiver, and a mobile telephone function.

8 Claims, 1 Drawing Sheet

FIG. 1

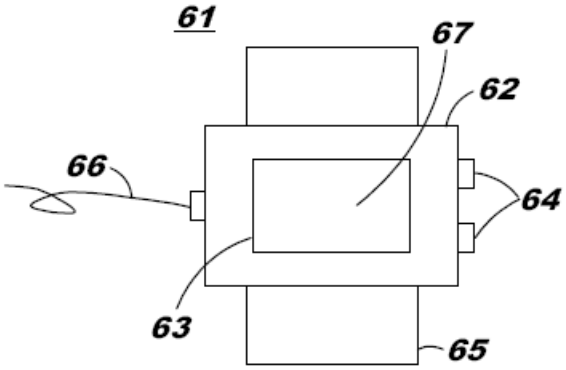


FIG. 1

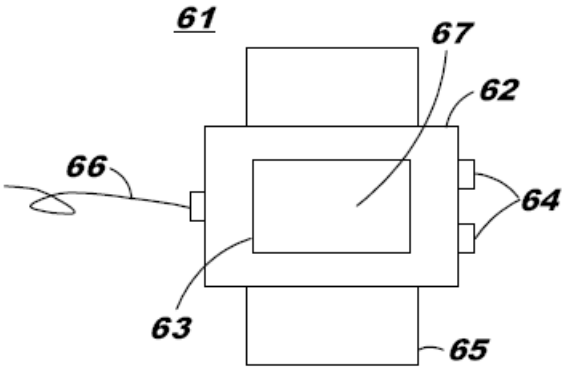


FIG. 2

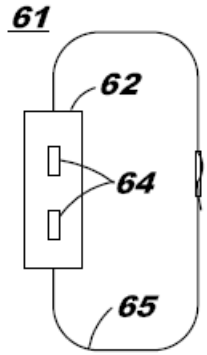
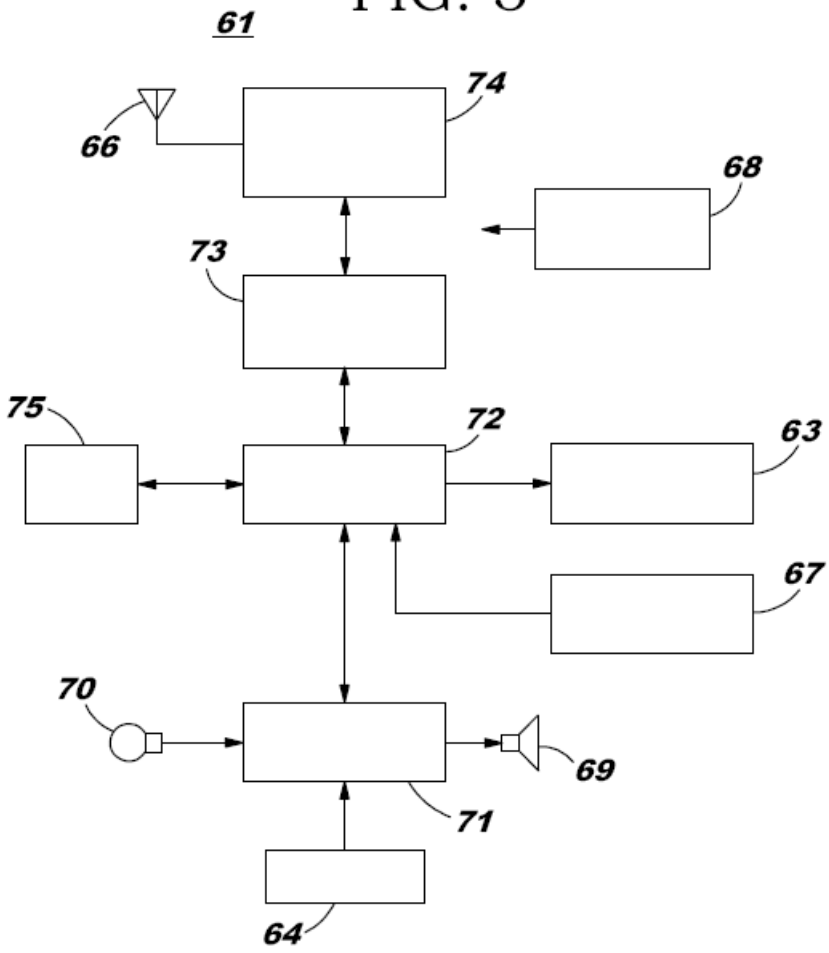


FIG. 3



VERSATILE WRISTWATCH SYSTEM

BACKGROUND

Wristwatches became popular in the 1920s. The earliest wristwatches were purely mechanical in function, relying upon a balance wheel to keep time. By the time of the present day, it has become commonplace for a wristwatch to rely upon a piezoelectric crystal to keep time. The display may be an analog display, with hands showing the time, or may be a digital display, for example making use of a liquid crystal display.

It would be helpful if a wristwatch were able to provide a variety of functions in addition to displaying the time of day, for example by means of electromagnetic transmission and reception.

SUMMARY OF THE INVENTION

A wristwatch system is provided having a piezoelectric crystal and a microcontroller, along with a software-defined radio and a digital signal processor. Communicatively coupled with the microcontroller are input/output devices including a touchscreen display and a microphone and speaker. Together with suitable software, the system provides not only a time-of-day display but also a two-way wrist radio transceiver, a television receiver, and a mobile telephone function.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is described with respect to a drawing in several figures, of which:

Fig. 1 is a plan view of a versatile wristwatch system according to the invention;

Fig. 2 is a side view of the system of Fig. 1; and

Fig. 3 is a functional block diagram of the system of Fig. 1.

Where possible, like reference numerals are employed among the figures to denote like parts or components.

DETAILED DESCRIPTION

The invention will now be described in some detail with reference to the figures.

Turning to Fig. 1, what is shown is a plan view of a versatile wristwatch system 61 according to the invention. The system 61 has a case 62, a watchband 65, push buttons 64, a display 63, and an antenna 66. In one em-bodiment, the antenna 66 extends at least twenty centimeters in length. The case 62 may be metal in which case the antenna 66 is external to the case.

Fig. 2 is a side view of the system 61 of Fig. 1. In one embodiment the watchband 65 has a clasp that permits adjusting the watchband 65 to accommodate the size of a particular wrist. The wrist is omitted for clarity in Fig. 2.

Fig. 3 is a functional block diagram of the system 61 of Fig. 1. A microcontroller 72 is powered by a power source 68. In one embodiment the power source 68 is a dis-posable and replaceable electrochemical cell, such as a lithium cell. The energy budget of the system 61 is such that the lithium cell can typically last for at least one hour.

The display 63 is controlled by the micro-controller 72, and a touchpad 67 overlays the display 63 and communicates to the micro-controller 72. In this way the touchpad 67 serves as a human input device for the microcontroller 72. A time base 75 is commun-icatively coupled with the microcontroller 72; the typical time base 75 comprises a piezo-electric crystal. A digital signal processor 73 ("DSP") is communicatively coupled with the microcontroller 72 and is likewise powered by the power source 68. A software-defined radio 74 ("SDR") is communicatively coupled with the DSP 73 and is likewise powered by the power source 68. The microcontroller 72, the DSP 73, the SDR 74, the time base 75, and the power source 68 are all contained within the case 62. The microcontroller 72 comprises a memory (omitted for clarity in Fig. 3) which stores software in the form of instructions. The instructions permit the microcontroller 72 to bring about the results described in connection with the invention.

The display 63 may be an organic light-emitting diode (OLED) display with a resolution of at least 60 by 100 pixels, each pixel controllable to 24 bits of color. The microcontroller 72 operates the time base 75 so as to keep track of the passage of time, and from time to time causes the display 63 to display information indicative of the time of day.

From time to time, the system 61 acquires an electromagnetic signal at the antenna 66. The electromagnetic signal is received in the SDR 74, and the received electromagnetic signal is demodulated in the DSP 73. The microcontroller 72 receives the demodulated received electromagnetic signal and drives a

human interface device accordingly. In one embodiment the electromagnetic signal is a television signal and the human interface device is the display 63. In another embodiment the electromagnetic signal is a mobile telephone signal and the human interface device is a speaker 69.

The alert reader will have no difficulty devising myriad obvious variations and improvements of the disclosed embodiments, all of which are intended to be encompassed within the claims which follow.

We claim:

1. A versatile wristwatch system comprising;

a microcontroller powered by a power source;

a display controlled by the microcontroller;

a touchpad overlaying the display and communicating to the microcontroller;

a time base communicatively coupled with the microcontroller;

a digital signal processor communicatively coupled with the microcontroller; and

a software-defined radio communicatively coupled with the digital signal processor;

a power source powering the microcontroller, the digital signal processor, and the software-defined radio;

the microcontroller, the digital signal processor, the software-defined radio, and the power source all contained within a case,

the system further comprising a watchband connected with the case and adjustably sized for encirclement of a human wrist.

2. The system of claim 1 wherein the power source is a lithium cell.

3. The system of claim 1 wherein the display has a resolution of at least 60 by 100 pixels, each pixel controllable to 24 bits of color.

4. The system of claim 1 wherein the time base comprises a piezoelectric crystal.

5. The system of claim 1 further comprising an antenna external to the case and extending at least twenty centimeters in length.

6. A method for use with a wristwatch having a case with respect to a time of day and with respect to passage of time, the method comprising:

operating a time base within the case by a microcontroller within the case so as to keep track of the passage of time;

displaying upon a display within the case information indicative of the time of day;

acquiring an electromagnetic signal at an antenna external to the case;

receiving the electromagnetic signal in a software-defined radio located within the case and connected with the antenna;

demodulating the received electromagnetic signal in a digital signal processor located within the case and communicatively coupled with the software-defined radio;

driving a human interface device by a microcontroller located within the case as a function of the demodulated received electromagnetic signal.

7. The method of claim 6 wherein the electromagnetic signal is a television signal and the human interface device is a display within the case.

8. The method of claim 6 wherein the electromagnetic signal is a mobile telephone signal and the human interface device is a speaker within the case.

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