

## DISPLAY DEVICE, ELECTRONIC APPLIANCE AND CAMERA

### BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a display device and an electronic appliance such as a camera.

[0003] 2. Description of the Related Art

[0004] Various types of flat-panel displays (FPDs) with a shallow physical depth, including liquid crystal displays and organic EL displays, have recently been increasingly popularized. FPDs have now found applications particularly frequently in personal computers, personal digital assistants (PDAs) and cell phones among other things.

[0005] Meanwhile, the "intelligence", i.e., the level of digital information processibility, of household electronic appliances has also been raised day after day by recent extensive research and development of digital information processing technologies. As a result, not just TVs and cameras (including digital still cameras and camcorders) but an increasing number of microwave ovens and refrigerators are now equipped with digital information processibility.

[0006] Taking these circumstances into account, the "display device" now should be regarded as playing an important role of interfacing human users with numerous types of machines surrounding them as well as the traditional role of outputting or presenting information thereon.

[0007] Conventional electronic appliances, however, have their own display devices, none of which is normally removable from its parent appliance or compatible with any other appliance.

### SUMMARY OF THE INVENTION

[0008] In order to overcome the problems described above, preferred embodiments of the present invention provide a display device that can be selectively connected to, and add display capabilities to, any electronic appliance on demand of the user and also provide an electronic appliance compatible with such a display device.

[0009] A display device according to a preferred embodiment of the present invention defines an attached state or a removed state with respect to an electronic appliance. The display device preferably includes a display section, a driver for driving the display section, a transceiver for transmitting or receiving a signal to/from the electronic appliance, and a system controller for controlling the driver and the transceiver. At least portion of the transceiver and at least portion of the system controller are preferably integrated together with the display section and the driver on the same substrate.

[0010] In one preferred embodiment of the present invention, the display device is preferably substantially in the shape of a rectangle in a plan view. In that case, a portion of the display device, including one side of the rectangle, is inserted into a member of the electronic appliance that receives the display device in a removable state.

[0011] In another preferred embodiment, the display device preferably further includes a power supply and has

the ability to conduct a display operation by itself even when the display device is in the removed state with respect to the electronic appliance.

[0012] In this particular preferred embodiment, the power supply may be attachable to, and removable from, the display device.

[0013] Alternatively, the power supply may include a solar battery.

[0014] As another alternative, the power supply may include a fuel battery.

[0015] As another alternative, power may be supplied to the power supply by electromagnetic induction while the display device is in the attached state with respect to the electronic appliance.

[0016] In still another preferred embodiment, the display device may further include a memory.

[0017] In that case, the memory is preferably attachable to, and removable from, the display device.

[0018] In yet another preferred embodiment, the display device may further include an imager.

[0019] In yet another preferred embodiment, the display device may further include an input circuit, which generates an instruction signal in response to user's operation.

[0020] In this particular preferred embodiment, the display device preferably further includes an input section, through which a command is input by user's manipulation.

[0021] In a specific preferred embodiment, the input section is preferably provided either on a surface of the display device so as to face a screen of the display section or on a side surface of the display device so as to cross the screen.

[0022] Specifically, the input section preferably includes a jog dial.

[0023] In yet another preferred embodiment, the display device may further include at least one circuit that is selected from the group consisting of a memory, an input circuit, and an imager. In that case, a portion of the at least one circuit is preferably integrated together with the other circuits on the substrate.

[0024] In yet another preferred embodiment, the at least portion of the transceiver and the at least portion of the system controller preferably each include a circuit component that is made of the same film as a circuit component of the display section or the driver.

[0025] In a specific preferred embodiment, the same film is preferably a continuous grain silicon film.

[0026] In yet another preferred embodiment, in the attached state, the display device preferably transmits or receives the signal to/from the electronic appliance by a non-contact method.

[0027] In yet another preferred embodiment, the display device may transmit or receive the signal to/from the electronic appliance by a radio communication technique.

[0028] Alternatively, the display device may transmit or receive the signal to/from the electronic appliance by an