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(54) **PORTFOLIO WITH EMBEDDED MOBILE ACCESSORY**

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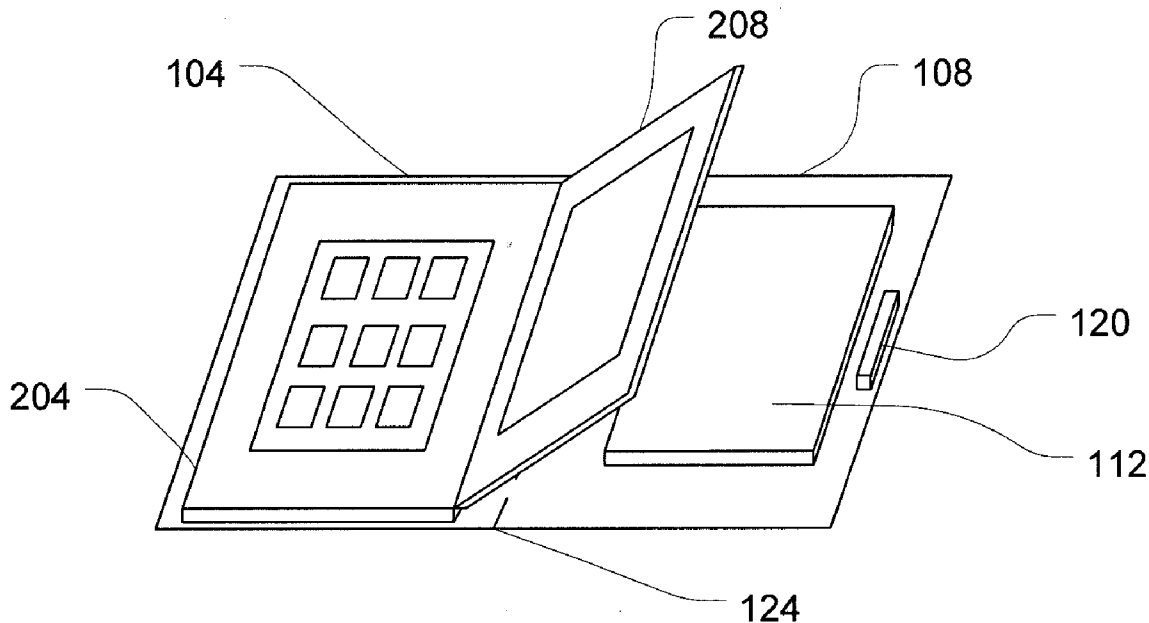
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(57) **ABSTRACT**

Embodiments of the present invention provide an apparatus and system for a portfolio with an embedded mobile accessory. The portfolio may include a communication interface to communicatively couple the mobile accessory to a mobile computing device.

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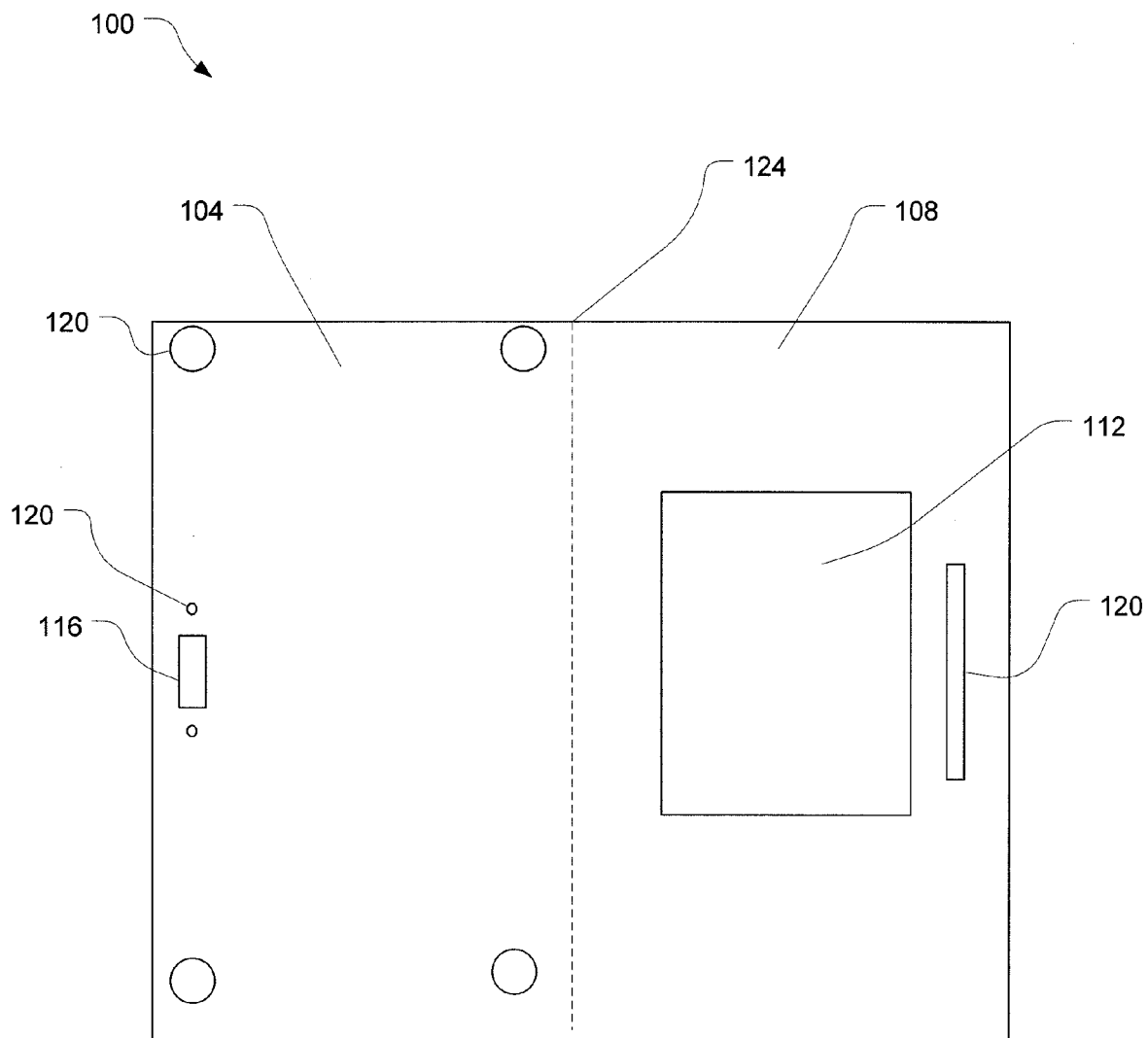


FIG. 1

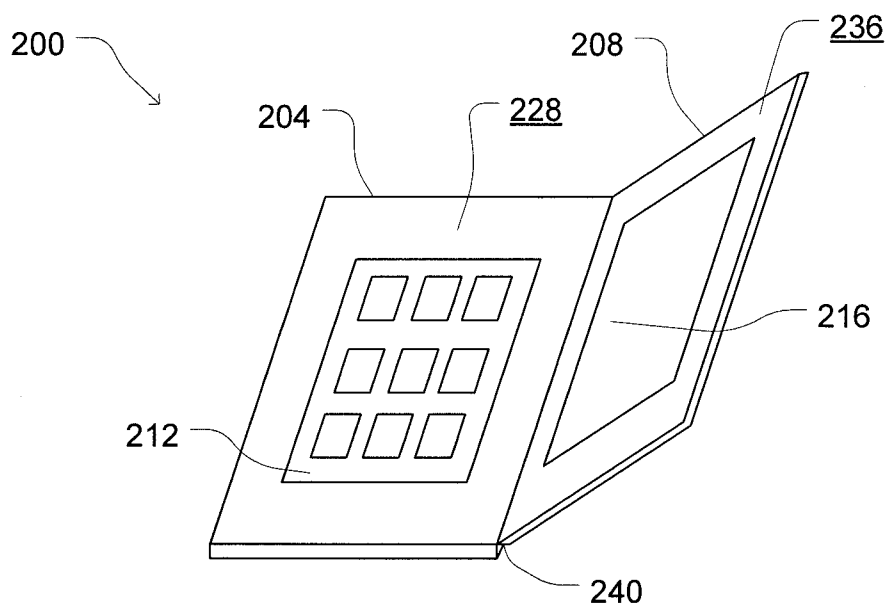


FIG. 2a

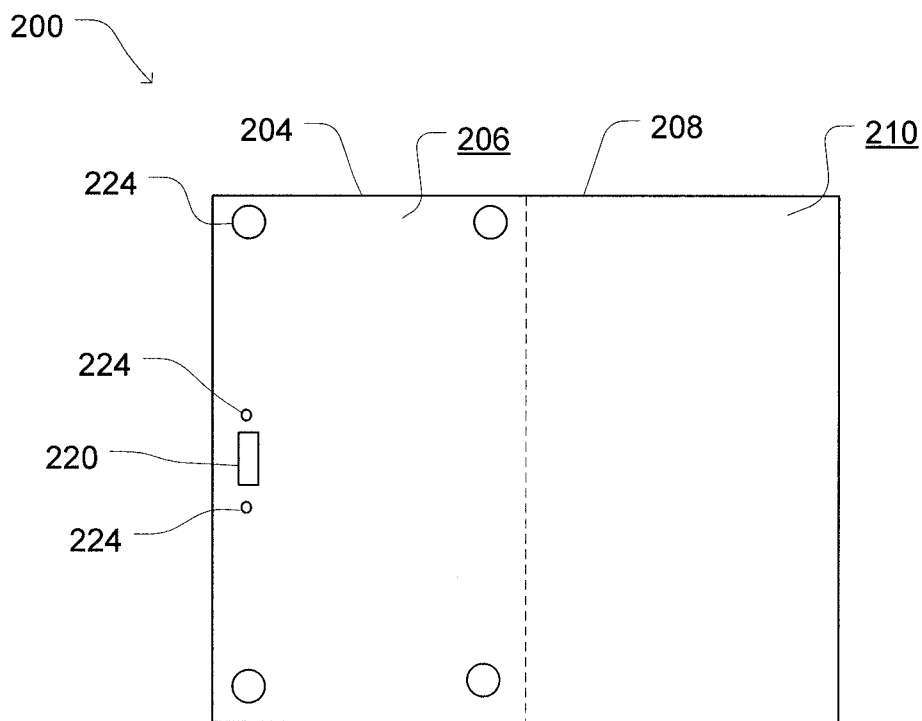


FIG. 2b

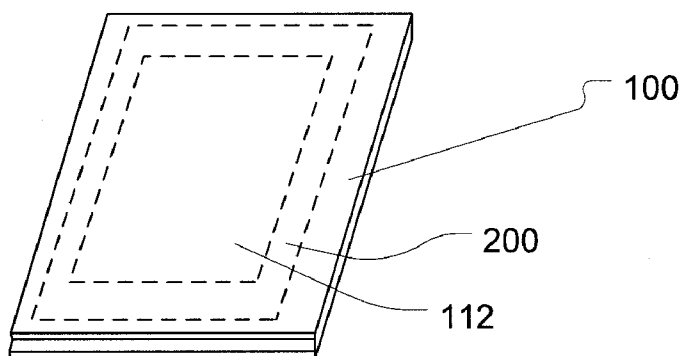


FIG. 3a

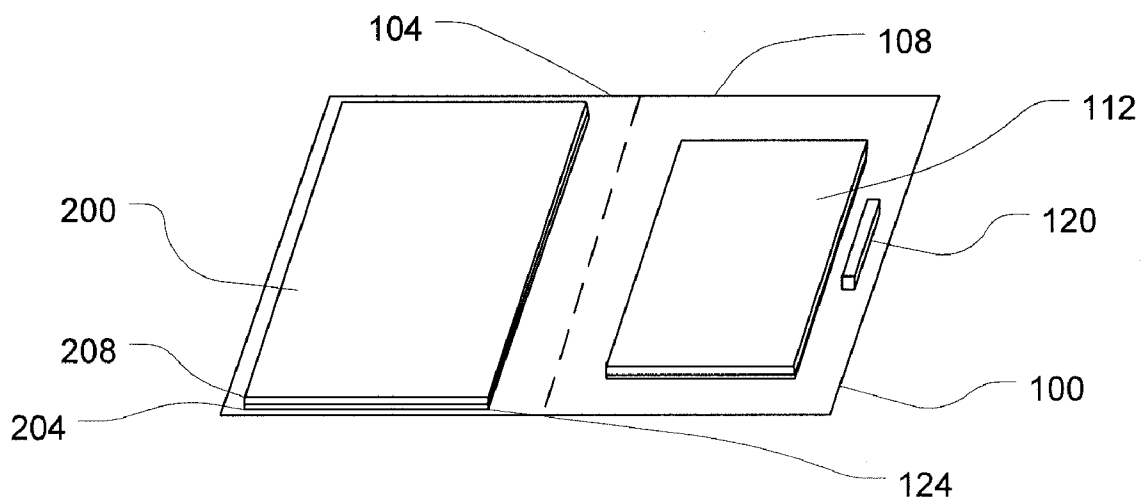


FIG. 3b

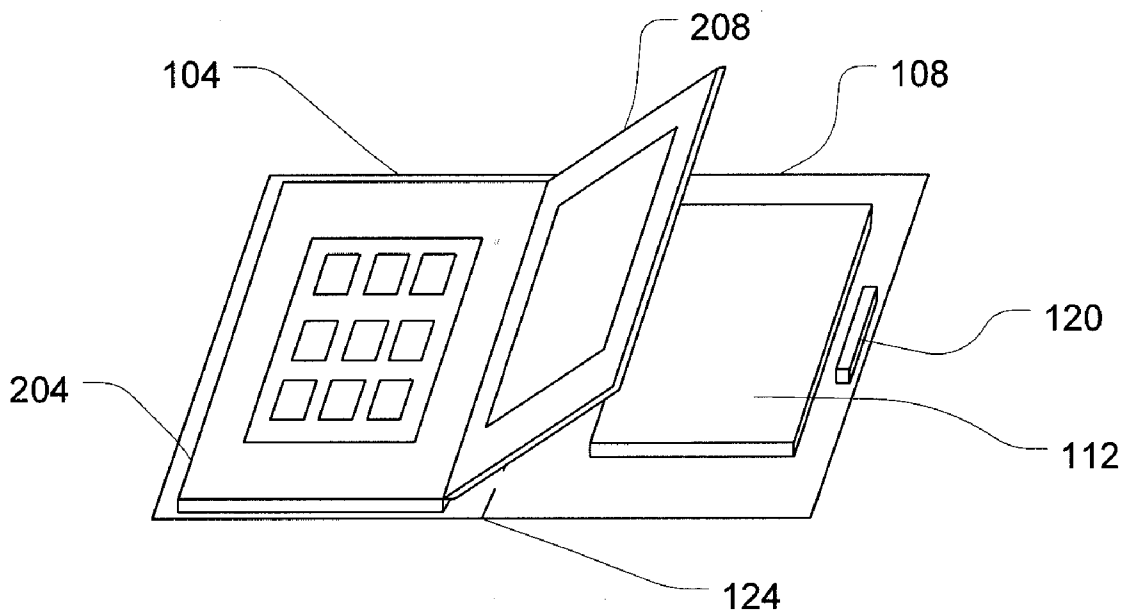


FIG. 3c

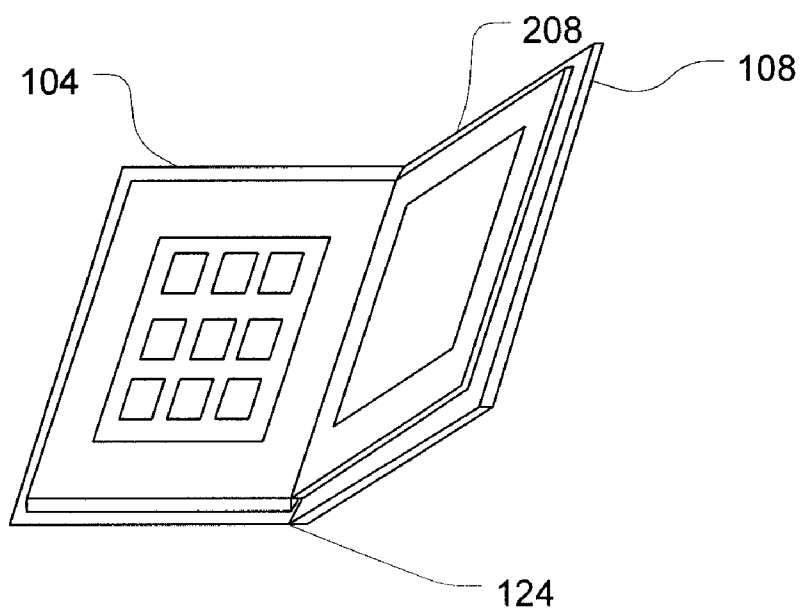


FIG. 3d

400

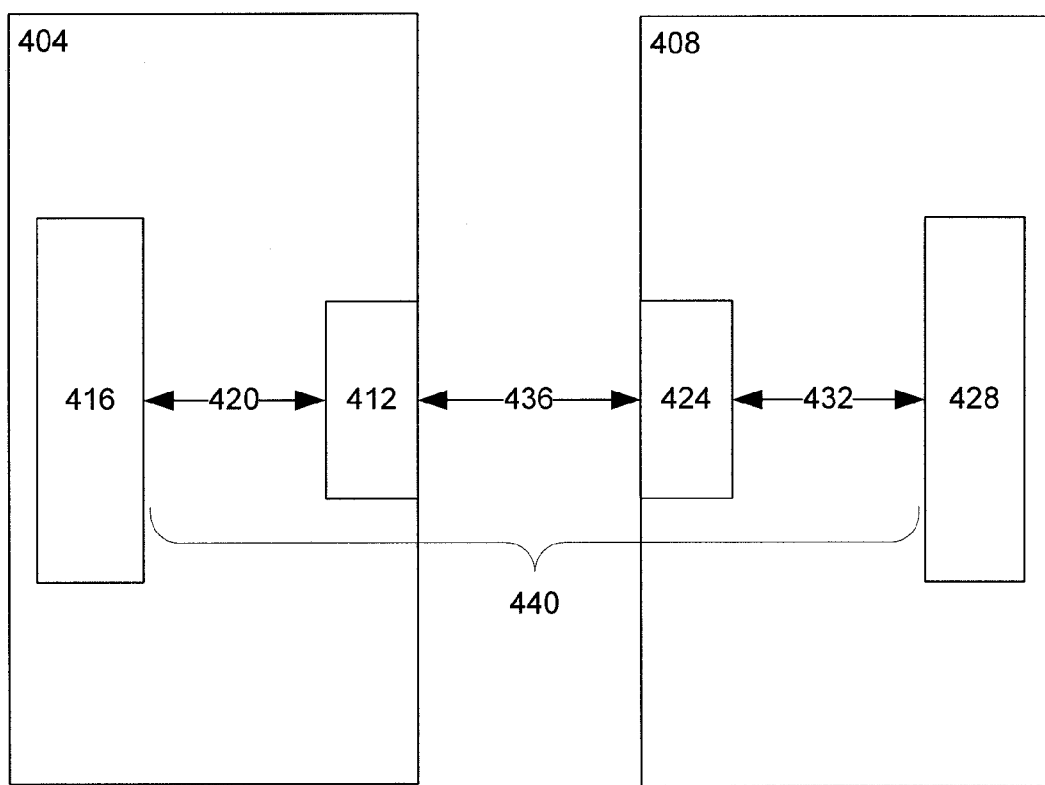


FIG. 4

PORTFOLIO WITH EMBEDDED MOBILE ACCESSORY

TECHNICAL FIELD

[0001] Embodiments of the present invention relate to the field of mobile devices and, more specifically, to a portfolio with embedded mobile accessory for use with such mobile devices.

BACKGROUND

[0002] Mobile accessories increase versatility of mobile computing devices by providing auxiliary functions to the devices. While these mobile accessories tend to be sufficiently small and portable they are not integrated with the mobile computing device and, therefore, require their own transport facilities. Usually, this may come in the form of being transported within one or more compartments of a carrier associated with the mobile computing device, e.g., a laptop case. Providing the necessary transport facilities for the mobile accessories and their components, e.g., power supplies, may compromise the mobility of the accessories themselves.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] Embodiments of the invention are illustrated by way of example and not by way of limitation in the figures of the accompanying drawings.

[0004] FIG. 1 illustrates a plan view of a portfolio in accordance with an embodiment of the present invention;

[0005] FIGS. 2a-2b respectively illustrate a perspective view and a plan view of a mobile computing device in accordance with an embodiment of the present invention;

[0006] FIGS. 3a-3d illustrate various positions of a portfolio and a mobile computing device in accordance with an embodiment of the present invention; and

[0007] FIG. 4 illustrates a block diagram of a system in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION

[0008] In the following detailed description, reference is made to the accompanying drawings which form a part hereof, and in which are shown by way of illustration embodiments in which the invention may be practiced. It is to be understood that other embodiments may be utilized and structural or logical changes may be made without departing from the scope of the present invention. Therefore, the following detailed description is not to be taken in a limiting sense, and the scope of embodiments in accordance with the present invention is defined by the appended claims and their equivalents.

[0009] The description may use perspective-based descriptions such as up/down, back/front, and top/bottom. Such descriptions are merely used to facilitate the discussion and are not intended to restrict the application of embodiments of the present invention.

[0010] The terms “coupled” and “connected,” along with their derivatives, may be used. It should be understood that these terms are not intended as synonyms for each other. Rather, in particular embodiments, “connected” may be used to indicate that two or more elements are in direct physical or electrical contact with each other. “Coupled” may mean that two or more elements are in direct physical or electrical contact. However, “coupled” may also mean that two or more

elements are not in direct contact with each other, but yet still cooperate or interact with each other.

[0011] For the purposes of the description, a phrase in the form “A/B” means A or B. For the purposes of the description, a phrase in the form “A and/or B” means “(A), (B), or (A and B).”

[0012] The description may use the phrases “in an embodiment,” or “in embodiments,” which may each refer to one or more of the same or different embodiments. Furthermore, the terms “comprising,” “including,” “having,” and the like, as used with respect to embodiments of the present invention, are synonymous.

[0013] In various embodiments of the present invention, methods, apparatuses, and systems for a portfolio with an embedded mobile accessory are provided. Portfolio, as used herein, may be a covering used to cover or partially cover a mobile computing device. In exemplary embodiments of the present invention, a computing system may be endowed with one or more components of the disclosed apparatuses and/or systems.

[0014] FIG. 1 illustrates a plan view of a portfolio 100, in accordance with an embodiment of the present invention. In particular, FIG. 1 illustrates an inside surface of the portfolio 100, which has a first cover 104 and a second cover 108.

[0015] The portfolio 100 may include a mobile accessory 112 in the second cover 108. The mobile accessory 112 may be designed to provide one or more auxiliary functions to a mobile computing device, e.g., mobile computing device 200 shown in FIGS. 2a-2b in accordance with various embodiments of the present invention. The mobile computing device 200 may include, but is not limited to, a laptop computing device (as generally shown), a mobile phone, a mobile personal digital assistant, etc. In various embodiments, the mobile accessory 112 may be any of a variety of accessories designed to provide auxiliary functions to such mobile computing devices.

[0016] In some embodiments, the mobile accessory 112 may provide one or more additional/alternative user interfaces to supplement user interfaces of the mobile computing device 200, e.g., an input device such as a keyboard 212 and an output device such as a display 216. For example, the mobile accessory 112 may include a supplementary display that may be used to provide a user with additional screen space, to provide the user with access to information when the primary display 216 is not active/visible, etc. In some of these embodiments, the display may be visible on an outside surface of the portfolio 100, the desirability of which may be discussed with reference to FIG. 3a.

[0017] For another example of a user interface, the mobile accessory 112 may be a graphics module. A graphics module may be an accessory that allows a user to input graphics (e.g., text, annotations, drawings, etc.) to an application operating on the mobile computing device 200 using a writing instrument, which may be an active or a passive device. In various embodiments, the graphics module may utilize various techniques (e.g., resistive, surface wave, capacitive, infrared, pressure sensing, optical imaging, dispersive signal technology, acoustic, magnetic, inductive, ultrasound, etc.) to determine the positioning of the writing instrument within a writing area.

[0018] In some embodiments, the mobile accessory 112 may provide other auxiliary functions to the mobile computing device 200. For example, the mobile accessory 112 may include a charging pad, e.g., an inductive or a conductive

charging pad. A charging pad may be utilized to recharge chargeable devices, e.g., mobile phones, mobile personal digital assistants, cameras, portable media players, input/output devices (e.g., wireless mouse, a headset), etc.

[0019] In various embodiments, the mobile accessory 112 may also include a solar panel having a photovoltaic array. A solar panel may be utilized to provide power for the mobile computing device 200 and/or the mobile accessory 112.

[0020] The second cover 108 may have a fastener 120 to mechanically couple the second cover 108 to an outside surface 210 of a top portion 208 of the mobile computing device 200. Similarly, the first cover 104 of the portfolio 100 may include fasteners 120 that may be designed to mechanically couple the first cover 104 to an outside surface 206 of a bottom portion 204 of the mobile computing device 200.

[0021] The fasteners 120 on the first cover 104 and the second cover 108 may include any combination of fasteners such as, but not limited to, screws, buttons, pins, snaps and/or magnetic fasteners. In various embodiments, any number of fasteners 120 may be used and they may be distributed over the portfolio 100 as shown in FIG. 1 (e.g., located at each corner on the first cover 104 and centered vertically along the right-hand side of second cover 108) or by some other pattern. The positioning of the fasteners 120 may account for operating characteristics of the portfolio 100 and/or mobile computing device. For example, if the fastener 120 on the cover 108 is a magnetic fastener, it may be positioned so as not to interfere with reception/transmission of an antenna embedded in the portion 208 of the mobile computing device 200.

[0022] In an embodiment, the outside surface 206 of the mobile computing device 200 may have fasteners 224 corresponding to the fasteners 120 on the first cover 104 of the portfolio 100. For example, the fasteners 120 on the first cover 104 may be male snap fasteners and the fasteners 224 may be female snap fasteners. As shown, the outside surface 210 may not have any dedicated fasteners to correspond to the fastener 120 on the second cover 108, which may be the case if the fastener 120 on the second cover 108 is a magnetic fastener.

[0023] In an embodiment, the first cover 104 may also have fasteners 120 located adjacent to a connector 116 on the first cover 104, which correspond to fasteners 224 adjacent to a connector 220 on portion 204. In an embodiment the fasteners 120 adjacent connector 116 may be pins and the fasteners 224 adjacent to the connector 220 may be holes to facilitate a mechanical coupling of the connectors 116 and 220. In various embodiments, these fasteners 120 and 224 may be any other type of fasteners.

[0024] The connectors 116 and 220 may be part of communication interfaces of the portfolio 100 and the mobile computing device 200, respectively. These communication interfaces may allow for the communicative coupling of the portfolio 100, and in particular, the mobile accessory 112, to the mobile computing device 200. While the communicative coupling of this embodiment may be through a direct electrical connection, other embodiments described herein may provide for communicative coupling of these components through a wireless link.

[0025] In various embodiments the connector 116 may be a female, a male, or a hermaphroditic connector to complement a male, female, or hermaphroditic connector of the connector 220, respectively.

[0026] In some embodiments, in order to complement a low profile form factor of the mobile computing device 200, the connectors 116 and 220 may be designed with a relatively low height dimension.

[0027] The keyboard 212 of the mobile computing device 200 may be disposed on an inside surface 228 of the bottom portion 204 opposite outside surface 206. The display 216 of the mobile computing device may be disposed on an inside surface 236 of the top portion 208 opposite the outside surface 210. The bottom portion 204 and the top portion 208 may be coupled to one another at an axis 240. The top portion 208 may rotate around the axis 240 to an open position (as shown) or to a closed position with the inside surface 236 coming together with inside surface 228.

[0028] In various embodiments, the portfolio 100 may have a seam 124 to allow the first cover 104 and the second cover 108 to rotate in a manner that complements rotation of the bottom portion 204 and top portion 208 of the mobile computing device 200. The first cover 104 and the second cover 108 may be made of a flexible material (e.g., leather, nylon, etc.) that allows the portfolio 100 to be folded along the seam 124 to provide for this complementary rotation, which is shown with respect to the mobile computing device 200 in the figures to follow.

[0029] FIGS. 3a-d illustrate various orientations of the portfolio 100 and mobile computing device 200, in accordance with various embodiments of the present invention. The illustrated orientations may elucidate the complementary rotation and mechanically coupling variations of the portfolio 100 and mobile computing device 200. Discussions related to the illustrated orientations may also discuss specific utilities of various embodiments. Other embodiments may include other coupling variations and/or utilities.

[0030] FIG. 3a illustrates both the portfolio 100 and the mobile computing device 200 in closed positions in accordance with an embodiment of this invention. In this embodiment the mobile computing device 200 may be substantially encased by the portfolio 100 with the bottom portion 204 mechanically coupled to first cover 104 and the top portion 208 mechanically coupled to the second cover 108.

[0031] This closed orientation may provide protection and/or concealment of the mobile computing device 200 by the portfolio 100. Additionally, and in accordance with various embodiments, the mobile accessory 112, and its associated functions, may be accessible from this closed orientation. In some embodiments, the mobile accessory 112 may be disposed on an outside surface of the second cover 108 (e.g., as a display showing a calendar or an e-mail inbox) or have a removable component (e.g., a stylus of a graphics module) to facilitate access in this closed orientation.

[0032] In some embodiments, the mobile accessory 112 may be functional even when the mobile computing device 200 is in a powered-down state (e.g., off or sleep state). In some embodiments, the mobile accessory 112 may be able to communicate system management controls to the mobile computing device 200 to power-up all or some of the components of the mobile computing device 200 when desired. This may allow the mobile accessory 112 to initiate communication with the mobile computing device 200 even when it is in a powered-down state.

[0033] In some embodiments the mobile accessory 112 may also store data and forward it when the mobile computing device 200 powers-up independent of controls issued by the mobile accessory 112. When the mobile computing

device 200 powers-up, the mobile accessory 112 and the mobile computing device 200 may synchronize, e.g., by a display updating a status of a calendar and/or e-mail inbox, a graphics pad uploading accumulated information to the mobile computing device 200, etc.

[0034] FIG. 3*b* illustrates the portfolio 100 in an open position with the first cover 104 mechanically coupled to the bottom portion 204 of the mobile computing device 200 in accordance with various embodiments of this invention. The mobile computing device 200 is closed in this figure and the second cover 108 is mechanically decoupled from the top portion 208. This orientation of the portfolio 100 and mobile computing device 200 may provide access to the mobile accessory 112 (if it is disposed on an interior surface of the second cover 108) and its associated functions without opening and/or powering up the mobile computing device 200.

[0035] FIG. 3*c* illustrates the portfolio 100 in an open position with the first cover 104 mechanically coupled to the bottom portion 204, the second cover 108 mechanically decoupled from the top portion 208, and the mobile computing device 200 in an open position in accordance with various embodiments of the present invention. This orientation may provide access to both the mobile accessory 112 (if it is disposed on an interior surface of the cover 108) and the mobile computing device 200.

[0036] FIG. 3*d* illustrates the mobile computing device 200 in an open position with the bottom portion 204 mechanically coupled to the first cover 104 and the top portion 208 mechanically coupled to the second cover 108 in accordance with various embodiments of the present invention. This may provide access to the mobile computing device 200 without having to mechanically decouple either of the covers of the portfolio 100.

[0037] In various embodiments the fasteners 120 and 224 utilized on the portfolio 100 and/or mobile computing device 200 may be selected to facilitate the mechanical coupling and decoupling of the cover 108 and the top portion 208 as discussed above.

[0038] FIG. 4 is a block diagram of a system 400 in accordance with an embodiment of the present invention. In this embodiment, a portfolio 404 may be communicatively coupled to a mobile computing device 408. The elements of system 400 may be similar to like-named elements described with reference to other figures.

[0039] The portfolio 404 may include a communication interface 412 communicatively coupled to a mobile accessory 416 over link 420.

[0040] The mobile computing device 408 may include a communication interface 424 communicatively coupled to a computing node 428. In various embodiments, the computing node 428 may include a processor, memory, storage, etc. designed to provide the functionality of the mobile computing device 408.

[0041] The communication interfaces 412 and 424 may be communicatively coupled to one another over link 436. In various embodiments, the link 436 may be a wired or wireless link. In an embodiment where the link 436 is a wireless link, the communication interfaces 412 and 424 may be referred to as wireless communication interfaces.

[0042] In various embodiments, the communication interfaces 412 and 424 may include connectors configured to provide direct electrical and/or mechanical connection between the portfolio 404 and mobile computing device 408.

Connectors may be connected directly to one another or electrically connected to one another over a cable.

[0043] The link 440 (which may be an aggregation of links 420, 432, and 436) may communicatively couple the mobile accessory 416 to the processing node 428 to provide for operation of the embodiments described herein. In various embodiments the link 440 may provide for data and/or control signaling between the two components.

[0044] In some embodiments, the link 440 may additionally/alternatively provide for power transmission between the portfolio 404 and the mobile computing device 408. For example, the system 400 may utilize the relatively large power source of the mobile computing device 408 to provide power to the mobile accessory 416 via the link 440. In another embodiment, the portfolio 404 may provide power to the mobile computing device 408, e.g., if the mobile accessory 416 includes a solar panel. In an embodiment providing for power transmission over the link 440, the connectors of the communication interfaces 412 and 424 may also serve to provide a power channel interface for their respective components.

[0045] In some embodiments, the portfolio 404 may have its own power source (solar panel or otherwise), independent from the power source of the mobile computing device 408.

[0046] In various embodiments, the link 440 may include data, control, and/or power channels. The channels of the link 440 may be organized as a universal serial bus (USB) and/or a control bus (e.g., a system management (SM) bus) to provide for these tasks.

[0047] Although certain embodiments have been illustrated and described herein for purposes of description of the preferred embodiment, it will be appreciated by those of ordinary skill in the art that a wide variety of alternate and/or equivalent embodiments or implementations calculated to achieve the same purposes may be substituted for the embodiments shown and described without departing from the scope of the present invention. Those with skill in the art will readily appreciate that embodiments in accordance with the present invention may be implemented in a very wide variety of ways. This application is intended to cover any adaptations or variations of the embodiments discussed herein. Therefore, it is manifestly intended that embodiments in accordance with the present invention be limited only by the claims and the equivalents thereof.

What is claimed is:

1. An apparatus comprising:

- a first cover configured to mechanically couple to a first surface of a mobile computing device and having a communication interface configured to communicatively couple the apparatus to the mobile computing device; and
- a second cover configured to mechanically couple to a second surface of the mobile computing device and having a mobile accessory communicatively coupled to the communication interface, the first cover coupled to the second cover in a manner to allow a first rotation between the first cover and the second cover to complement a second rotation between the first surface and the second surface.

2. The apparatus of claim 1, wherein the first cover is configured to mechanically couple to the first surface by one or more fasteners.

3. The apparatus of claim 2, wherein the second cover is configured to mechanically couple to the second surface by one or more additional fasteners.

4. The apparatus of claim 2, wherein the one or more fasteners include a button, a pin, a snap and/or a magnetic fastener.

5. The apparatus of claim 1, wherein the communication interface comprises a connector.

6. The apparatus of claim 1, wherein the mobile accessory is configured to transmit one or more control signals to the mobile computing device through the communication interface to power-up the mobile computing device.

7. The apparatus of claim 1, wherein the mobile accessory includes a display, a charging pad, solar panel, and/or a graphics module.

8. The apparatus of claim 1, wherein the communication interface is a wireless communication interface.

9. The apparatus of claim 1, wherein the first and/or the second cover comprise a flexible material.

10. The apparatus of claim 1, wherein the second cover is further configured to be mechanically decoupled from the second surface while the first cover is mechanically coupled to the first surface.

11. An apparatus comprising:
a communication interface configured to communicatively couple the apparatus to a mobile accessory within a portfolio;
a first portion having an input device;
a second portion having a display;
a hinge connected to the first and second portions and configured to allow the first and second portions to rotate with respect to one another; and
a plurality of fasteners configured to mechanically couple the apparatus to the portfolio.

12. The apparatus of claim 11, wherein the one or more fasteners include a button, a pin, a snap and/or a magnetic fastener.

13. The apparatus of claim 11, wherein the communication interface comprises a connector.

14. The apparatus of claim 11, wherein the communication interface comprises a control channel to receive one or more control signals from the mobile accessory to power-up the mobile computing device.

15. The apparatus of claim 11, wherein the communication interface is a wireless communication interface.

16. The apparatus of claim 11, wherein the apparatus comprises a laptop computing device.

17. A system comprising:

a first cover configured to mechanically couple to a first surface of a mobile computing device and having a connector configured to communicatively couple the system to the mobile computing device, the connector further configured to provide a power channel interface to the mobile computing device; and

a second cover configured to mechanically couple to a second surface of the mobile computing device and having a mobile accessory communicatively coupled to the connector, the first cover coupled to the second cover in a manner to allow a first rotation between the first cover and the second cover to complement a second rotation between the first surface and the second surface.

18. The system of claim 17, wherein the mobile accessory comprises a solar panel and the system is further configured to provide power to the mobile computing device via the power channel interface.

19. The system of claim 17, wherein the mobile accessory is configured to receive power from the mobile computing device via the power channel interface.

20. The system of claim 17, wherein the mobile accessory includes a display, a charging pad, a solar panel, and/or a graphics module.

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