United States Patent	12392448
Kind Code	B2
Date of Patent	August 19, 2025
Inventor(s)	Seo; Pilwon et al.

Electronic device comprising transparent display and structure for supporting transparent display

Abstract

An electronic device is provided. The electronic device includes a transparent display which is disposed between a first frame having a first opening formed therethrough and a second frame having a second opening formed therethrough, so as to be supported by the first frame and the second frame, a housing including a first hole through which a first connection member is exposed to the outside of the electronic device and a second hole through which a second connection member is exposed to the outside of the electronic device, the housing being coupled to at least one of the first frame or the second frame, a standing member for supporting the housing at a predetermined angle so as to enable the transparent display to display information while being inclined at the predetermined angle, and a printed circuit board electrically connected to the transparent display and including a processor.

Inventors: **Seo; Pilwon (Suwon-si, KR), Yoon; Jonggeun (Suwon-si, KR), Lim; Chankyu (Suwon-si, KR), Choi; Minhyuk (Suwon-si, KR), Park; Deokjin (Suwon-si, KR), Lee; Jiwoo (Suwon-si, KR)**

Applicant: **Samsung Electronics Co., Ltd.** (Suwon-si, KR)

Family ID: **1000008766133**

Assignee: **Samsung Electronics Co., Ltd. (Suwon-si, KR)**

Appl. No.: **17/862938**

Filed: **July 12, 2022**

Prior Publication Data

Document Identifier	Publication Date
US 20220349517 A1	Nov. 03, 2022

Foreign Application Priority Data

KR	10-2020-0012012	Jan. 31, 2020

Related U.S. Application Data

continuation parent-doc WO PCT/KR2021/001046 20210127 PENDING child-doc US 17862938

Publication Classification

Int. Cl.: **F16M13/00** (20060101); **F16M11/10** (20060101); **F16M11/18** (20060101)

U.S. Cl.:

CPC **F16M13/005** (20130101); **F16M11/10** (20130101); **F16M11/18** (20130101);

Field of Classification Search

CPC: F16M (13/005); F16M (11/10); F16M (11/18); F16M (2200/08); F16M (13/00); F16M (11/06); G06F (1/16); G06F (3/041); G06F (1/1601); G06F (1/1637); G06F (1/166)

References Cited

U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
5706559	12/1997	Oliver	24/453	F16B 21/088
6561600	12/2002	Seeley	312/257.1	B60R 11/0235
6694683	12/2003	Anderson	52/204.5	F23M 11/042
6806850	12/2003	Chen	353/72	G06F 1/1616
8339536	12/2011	Sakamoto	349/59	G02F 1/133308
9223338	12/2014	Mukaide	N/A	G02F 1/133308
2005/0105257	12/2004	Shimizu	361/679.08	G06F 1/1601
2006/0050196	12/2005	Lee	349/58	G02F 1/133308
2008/0276516	12/2007	Lin	40/797	G06F 1/1601
2010/0148022	12/2009	Wang	248/161	F16M 11/10
2010/0171011	12/2009	Wang	248/188.8	F16M 11/10
2012/0105424	12/2011	Lee et al.	N/A	N/A
2013/0021728	12/2012	Yamamoto	361/679.01	G06F 1/1637
2013/0107126	12/2012	Nonomura	361/679.41	H04N 5/64
2013/0107138	12/2012	Matsumoto	361/810	H04N 5/64
2014/0085783	12/2013	Li	361/679.01	G06F 1/166
2014/0118306	12/2013	Moses et al.	N/A	N/A
2016/0327729	12/2015	Patterson	N/A	G06F 3/041
2017/0060209	12/2016	Volek	N/A	G06F 1/266
2018/0160096	12/2017	Lee et al.	N/A	N/A

2018/0359869	12/2017	Kim et al.	N/A	N/A

FOREIGN PATENT DOCUMENTS

Patent No.	Application Date	Country	CPC
2006-293626	12/2005	JP	N/A
10-2014-0077570	12/2013	KR	N/A
10-1399209	12/2013	KR	N/A
10-2015-0073210	12/2014	KR	N/A
10-1843337	12/2017	KR	N/A
10-2018-0071510	12/2017	KR	N/A
10-2018-0071602	12/2017	KR	N/A
10-2018-0135704	12/2017	KR	N/A
10-1947113	12/2018	KR	N/A
10-2039694	12/2018	KR	N/A

OTHER PUBLICATIONS

Korean Office action dated Aug. 13, 2024, issued in Korean Application No. 10-2020-0012012. cited by applicant

---

Primary Examiner: Sitta; Grant

Attorney, Agent or Firm: Jefferson IP Law, LLP

Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION(S) (1) This application is a continuation application, claiming priority under § 365(c), of an International application No. PCT/KR2021/001046, filed on Jan. 27, 2021, which is based on and claims the benefit of a Korean patent application number 10-2020-0012012, filed on Jan. 31, 2020, in the Korean Intellectual Property Office, the disclosure of which is incorporated by reference herein in its entirety.

BACKGROUND
1. Field
(1) The disclosure relates to an electronic device including a transparent display and a transparent display support structure configured to support a transparent display.
2. Description of Related Art
(2) In line with development of display technologies, transparent displays have been developed.
(3) Transparent displays include, unlike existing displays, display components made of materials having high levels of optical transmittance. As a result, transparent displays may have transparency.
(4) Transparent displays can display information through both surfaces, can easily draw people's attentions as a new concept of displays, and thus can be used for a digital signage apparatus.
(5) The above information is presented as background information only to assist with an understanding of the disclosure. No determination has been made, and no assertion is made, as to whether any of the above might be applicable as prior art with regard to the disclosure.
SUMMARY
(6) Transparent displays transmit light through both surfaces and display information through both surfaces, and thus require a different type of support structures from existing displays.
(7) Existing support structures are designed such that a display can be supported by using one surface of the display, but a transparent display that displays information through both surfaces

needs a support structure having openings formed through both surfaces.
(8) In addition, a transparent display needs to remain inclined with regard to the ground on which the transparent display is installed such that the user can easily identify information displayed by the transparent display.
(9) Aspects of the disclosure are to address at least the above-mentioned problems and/or disadvantages and to provide at least the advantages described below. Accordingly, an aspect of the disclosure is to provide a new form factor for supporting a transparent display such that, even when the transparent display is inclined, the transparent display can be supported stably.
(10) Additional aspects will be set forth in part in the description which follows and, in part, will be apparent from the description, or may be learned by practice of the presented embodiments.
(11) In accordance with an aspect of the disclosure, an electronic device is provided. The electronic device includes a first frame including a first region in which a first opening is formed, and a second region in which a plate-shaped support is formed, a second frame coupled to the first frame and having a second opening formed through a portion corresponding to the first region and the second region of the first frame, a transparent display configured to display information on both surfaces thereof through the first opening of the first frame and the second opening of the second frame and disposed between the first frame and the second frame to be supported by the first frame and the second frame, a housing including a first hole configured to expose a first receptacle to outside of the electronic device, and a second hole configured to expose a second receptacle to the outside of the electronic device and coupled to at least one of the first frame or the second frame, a standing member configured to support the housing at a predetermined angle so as to enable the transparent display to display information while being inclined at a predetermined angle, and a printed circuit board which is electrically connected to the transparent display and on which electronic components including a processor are disposed.
(12) In accordance with another aspect of the disclosure, a transparent display support structure is provided. The transparent display support structure includes a first frame including a first region in which a first opening is formed, and a second region in which a plate-shaped support is formed, a second frame coupled to the first frame and having a second opening formed through a portion corresponding to the first region and the second region of the first frame, a housing coupled to at least one of the first frame or the second frame, and a standing member configured to support the housing at a predetermined angle, wherein the first frame and the second frame support the transparent display disposed between the first frame and the second frame and configured to display information on both surfaces thereof through the first opening of the first frame and the second opening of the second frame.
(13) According to various embodiments of the disclosure, a transparent display can be stably supported.
(14) In addition, even when the transparent display is inclined with regard to the ground, the transparent display can be stably supported.
(15) Other aspects, advantages, and salient features of the disclosure will become apparent to those skilled in the art from the following detailed description, which, taken in conjunction with the annexed drawings, discloses various embodiments of the disclosure.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
(1) The above and other aspects, features, and advantages of certain embodiments of the disclosure will be more apparent from the following description taken in conjunction with the accompanying drawings, in which:
(2) FIG. **1** is a block diagram of an electronic device in a network environment, according to an

embodiment of the disclosure;
(3) FIG. **2**A is a front perspective view and a rear perspective view of an electronic device according to an embodiment of the disclosure;
(4) FIG. **2**B is an exploded perspective view of the electronic device illustrated in FIG. **2**A according to an embodiment of the disclosure;
(5) FIG. **3**A is an exploded perspective view illustrating a transparent display and a support structure thereof according to an embodiment of the disclosure;
(6) FIG. **3**B is a schematic diagram showing a transparent display and a support structure thereof according to an embodiment of the disclosure;
(7) FIG. **3**C is a cross-sectional view, taken along line A-A of FIG. **3**B according to an embodiment of the disclosure;
(8) FIG. **4** is an exploded perspective view of a housing and a standing member according to an embodiment of the disclosure;
(9) FIGS. **5**A, **5**B, and **5**C show electronic components included in an electronic device and a connection relationship therebetween, according to various embodiments of the disclosure;
(10) FIG. **6** is a block diagram of an electronic device according to an embodiment of the disclosure;
(11) FIG. **7** is a block diagram of an electronic device according to an embodiment of the disclosure;
(12) FIG. **8** is an operation flowchart of an electronic device according to an embodiment of the disclosure; and
(13) FIGS. **9**A and **9**B illustrate a state in which an electronic device is being used, according to various embodiments of the disclosure.
(14) Throughout the drawings, it should be noted that like reference numbers are used to depict the same or similar elements, features, and structures.

DETAILED DESCRIPTION

(15) The following description with reference to the accompanying drawings is provided to assist in a comprehensive understanding of various embodiments of the disclosure as defined by the claims and their equivalents. It includes various specific details to assist in that understanding but these are to be regarded as merely exemplary. Accordingly, those of ordinary skill in the art will recognize that various changes and modifications of the various embodiments described herein can be made without departing from the scope and spirit of the disclosure. In addition, descriptions of well-known functions and constructions may be omitted for clarity and conciseness.
(16) The terms and words used in the following description and claims are not limited to the bibliographical meanings, but, are merely used by the inventor to enable a clear and consistent understanding of the disclosure. Accordingly, it should be apparent to those skilled in the art that the following description of various embodiments of the disclosure is provided for illustration purpose only and not for the purpose of limiting the disclosure as defined by the appended claims and their equivalents.
(17) It is to be understood that the singular forms “a,” “an,” and “the” include plural referents unless the context clearly dictates otherwise. Thus, for example, reference to “a component surface” includes reference to one or more of such surfaces.
(18) With regard to the description of the drawings, similar reference numerals may be used to refer to similar or related elements. It is to be understood that a singular form of a noun corresponding to an item may include one or more of the things, unless the relevant context clearly indicates otherwise.
(19) As used herein, each of such phrases as “A or B”, “at least one of A and B”, “at least one of A or B”, “A, B, or C”, “at least one of A, B, and C”, and “at least one of A, B, or C” may include any one of, or all possible combinations of the items enumerated together in a corresponding one of the phrases. As used herein, such terms as “1st” and “2nd”, or “first” and “second” may be used to

simply distinguish a corresponding component from another, and does not limit the components in other aspect (e.g., importance or order). It is to be understood that if an element (e.g., a first element) is referred to, with or without the term “operatively” or “communicatively”, as “coupled with”, “coupled to”, “connected with”, or “connected to” another element (e.g., a second element), it means that the element may be coupled with the other element directly (e.g., wiredly), wirelessly, or via a third element.

(20) FIG. **1** is a block diagram illustrating an electronic device in a network environment according to an embodiment of the disclosure.

(21) Referring to FIG. **1**, an electronic device **101** in a network environment **100** may communicate with an electronic device **102** via a first network **198** (e.g., a short-range wireless communication network), or at least one of an electronic device **104** or a server **108** via a second network **199** (e.g., a long-range wireless communication network). According to an embodiment, the electronic device **101** may communicate with the electronic device **104** via the server **108**. According to an embodiment, the electronic device **101** may include a processor **120**, memory **130**, an input module **150**, a sound output module **155**, a display module **160**, an audio module **170**, a sensor module **176**, an interface **177**, a connecting terminal **178**, a haptic module **179**, a camera module **180**, a power management module **188**, a battery **189**, a communication module **190**, a subscriber identification module (SIM) **196**, or an antenna module **197**. In some embodiments, at least one (e.g., the display device **160** or the camera module **180**) of the components may be omitted from the electronic device **101**, or one or more other components may be added in the electronic device **101**. In some embodiments, some of the components may be implemented as single integrated circuitry. For example, the sensor module **176** (e.g., a fingerprint sensor, an iris sensor, or an illuminance sensor) may be implemented as embedded in the display device **160** (e.g., a display).

(22) The processor **120** may execute, for example, software (e.g., a program **140**) to control at least one other component (e.g., a hardware or software component) of the electronic device **101** coupled with the processor **120**, and may perform various data processing or computation. According to one embodiment, as at least part of the data processing or computation, the processor **120** may store a command or data received from another component (e.g., the sensor module **176** or the communication module **190**) in volatile memory **132**, process the command or the data stored in the volatile memory **132**, and store resulting data in non-volatile memory **134**. According to an embodiment, the processor **120** may include a main processor **121** (e.g., a central processing unit (CPU) or an application processor (AP)), or an auxiliary processor **123** (e.g., a graphics processing unit (GPU), a neural processing unit (NPU), an image signal processor (ISP), a sensor hub processor, or a communication processor (CP)) that is operable independently from, or in conjunction with, the main processor **121**. For example, when the electronic device **101** includes the main processor **121** and the auxiliary processor **123**, the auxiliary processor **123** may be adapted to consume less power than the main processor **121**, or to be specific to a specified function. The auxiliary processor **123** may be implemented as separate from, or as part of the main processor **121**.

(23) The auxiliary processor **123** may control at least some of functions or states related to at least one component (e.g., the display module **160**, the sensor module **176**, or the communication module **190**) among the components of the electronic device **101**, instead of the main processor **121** while the main processor **121** is in an inactive (e.g., sleep) state, or together with the main processor **121** while the main processor **121** is in an active state (e.g., executing an application). According to an embodiment, the auxiliary processor **123** (e.g., an image signal processor or a communication processor) may be implemented as part of another component (e.g., the camera module **180** or the communication module **190**) functionally related to the auxiliary processor **123**.

(24) The memory **130** may store various data used by at least one component (e.g., the processor **120** or the sensor module **176**) of the electronic device **101**. The various data may include, for example, software (e.g., the program **140**) and input data or output data for a command related

thereto. The memory **130** may include the volatile memory **132** or the non-volatile memory **134**.
(25) The program **140** may be stored in the memory **130** as software, and may include, for example, an operating system (OS) **142**, middleware **144**, or an application **146**.
(26) The input module **150** may receive a command or data to be used by another component (e.g., the processor **120**) of the electronic device **101**, from the outside (e.g., a user) of the electronic device **101**. The input module **150** may include, for example, a microphone, a mouse, a keyboard, a key (e.g., a button), or a digital pen (e.g., a stylus pen). According to various embodiments, the input module **150** may recognize the user's voice. The input module **150** may receive a command via the user's voice. The input module **150** may be a multi-microphone device corresponding to a 360-degree direction so as to recognize a voice generated in the vicinity of the electronic device **101**.
(27) The sound output module **155** may output sound signals to the outside of the electronic device **101**. The sound output module **155** may include, for example, a speaker or a receiver. The speaker may be used for general purposes, such as playing multimedia or playing record. The receiver may be used for receiving incoming calls. According to an embodiment, the receiver may be implemented as separate from, or as part of the speaker.
(28) The display module **160** may visually provide information to the outside (e.g., a user) of the electronic device **101**. The display module **160** may include, for example, a display, a hologram device, or a projector and control circuitry to control a corresponding one of the display, hologram device, and projector. According to an embodiment, the display module **160** may include a touch sensor adapted to detect a touch, or a pressure sensor adapted to measure the intensity of force incurred by the touch.
(29) The audio module **170** may convert a sound into an electrical signal and vice versa. According to an embodiment, the audio module **170** may obtain the sound via the input module **150**, or output the sound via the sound output module **155** or a headphone of an external electronic device (e.g., an electronic device **102**) directly (e.g., wiredly) or wirelessly coupled with the electronic device **101**.
(30) The sensor module **176** may detect an operational state (e.g., power or temperature) of the electronic device **101** or an environmental state (e.g., a state of a user) external to the electronic device **101**, and then generate an electrical signal or data value corresponding to the detected state. According to an embodiment, the sensor module **176** may include, for example, a gesture sensor, a gyro sensor, an atmospheric pressure sensor, a magnetic sensor, an acceleration sensor, a grip sensor, a proximity sensor, a color sensor, an infrared (IR) sensor, a biometric sensor, a temperature sensor, a humidity sensor, or an illuminance sensor.
(31) The interface **177** may support one or more specified protocols to be used for the electronic device **101** to be coupled with the external electronic device (e.g., the electronic device **102**) directly (e.g., wiredly) or wirelessly. According to an embodiment, the interface **177** may include, for example, a high definition multimedia interface (HDMI), a universal serial bus (USB) interface, a secure digital (SD) card interface, or an audio interface.
(32) A connecting terminal **178** may include a connector via which the electronic device **101** may be physically connected with the external electronic device (e.g., the electronic device **102**). According to one embodiment, the connection terminal **178** may include, for example, an HDMI connector, a USB connector, an SD card connector, a display port (DP), or an audio connector (e.g., a headphone connector).
(33) The haptic module **179** may convert an electrical signal into a mechanical stimulus (e.g., a vibration or a movement) or electrical stimulus which may be recognized by a user via his tactile sensation or kinesthetic sensation. According to an embodiment, the haptic module **179** may include, for example, a motor, a piezoelectric element, or an electric stimulator.
(34) The camera module **180** may capture a still image or moving images. According to an embodiment, the camera module **180** may include one or more lenses, image sensors, image signal processors, or flashes.

(35) The power management module **188** may manage power supplied to the electronic device **101**. According to one embodiment, the power management module **188** may be implemented as at least part of, for example, a power management integrated circuit (PMIC). Power supplied to the electronic device **101** may be supplied in a wired or wireless manner. For example, the electronic device **101** may include a wireless charging module (not shown) to wirelessly receive power. The wireless charging module may be a device configured to receive power by a magnetic induction method or a resonance induction method. The wireless charging module may include a wireless charging coil in which a conductive metal wire is wound.
(36) The battery **189** may supply power to at least one component of the electronic device **101**. According to an embodiment, the battery **189** may include, for example, a primary cell which is not rechargeable, a secondary cell which is rechargeable, or a fuel cell.
(37) The communication module **190** may support establishing a direct (e.g., wired) communication channel or a wireless communication channel between the electronic device **101** and the external electronic device (e.g., the electronic device **102**, the electronic device **104**, or the server **108**) and performing communication via the established communication channel. The communication module **190** may include one or more communication processors that are operable independently from the processor **120** (e.g., the application processor (AP)) and supports a direct (e.g., wired) communication or a wireless communication. According to an embodiment, the communication module **190** may include a wireless communication module **192** (e.g., a cellular communication module, a short-range wireless communication module, or a global navigation satellite system (GNSS) communication module) or a wired communication module **194** (e.g., a local area network (LAN) communication module or a power line communication (PLC) module). A corresponding one of these communication modules may communicate with the external electronic device via the first network **198** (e.g., a short-range communication network, such as Bluetooth™ wireless-fidelity (Wi-Fi) direct, or infrared data association (IrDA)) or the second network **199** (e.g., a long-range communication network, such as a legacy cellular network, a 5G network, a next-generation communication network, the Internet, or a computer network (e.g., LAN or wide area network (WAN)). These various types of communication modules may be implemented as a single component (e.g., a single chip), or may be implemented as multi components (e.g., multi chips) separate from each other. The wireless communication module **192** may identify and authenticate the electronic device **101** in a communication network, such as the first network **198** or the second network **199**, using subscriber information (e.g., international mobile subscriber identity (IMSI)) stored in the subscriber identification module **196**.
(38) The antenna module **197** may transmit or receive a signal or power to or from the outside (e.g., the external electronic device) of the electronic device **101**. According to an embodiment, the antenna module **197** may include an antenna including a radiating element composed of a conductive material or a conductive pattern formed in or on a substrate (e.g., a printed circuit board (PCB)). According to an embodiment, the antenna module **197** may include a plurality of antennas (e.g., array antennas). In such a case, at least one antenna appropriate for a communication scheme used in the communication network, such as the first network **198** or the second network **199**, may be selected, for example, by the communication module **190** (e.g., the wireless communication module **192**) from the plurality of antennas. The signal or the power may then be transmitted or received between the communication module **190** and the external electronic device via the selected at least one antenna. According to an embodiment, another component (e.g., a radio frequency integrated circuit (RFIC)) other than the radiating element may be additionally formed as part of the antenna module **197**. According to various embodiments, the antenna module **197** may transmit and receive a 5G communication signal so that the electronic device **101** can support 5G communication. For example, the antenna module **197** may transmit and receive signals in several gigahertz bands and several tens to several hundreds of gigahertz bands (e.g., mmWave). The antenna module may include a plurality of antennas (e.g., a plurality of patch array antennas) to

generate an RF beam.
(39) At least some of the above-described components may be coupled mutually and communicate signals (e.g., commands or data) therebetween via an inter-peripheral communication scheme (e.g., a bus, general purpose input and output (GPIO), serial peripheral interface (SPI), or mobile industry processor interface (MIPI)).
(40) According to an embodiment, commands or data may be transmitted or received between the electronic device **101** and the external electronic device **104** via the server **108** coupled with the second network **199**. Each of the electronic devices **102** or **104** may be a device of a same type as, or a different type, from the electronic device **101**. According to an embodiment, all or some of operations to be executed at the electronic device **101** may be executed at one or more of the external electronic devices **102**, **104**, or **108**. For example, if the electronic device **101** should perform a function or a service automatically, or in response to a request from a user or another device, the electronic device **101**, instead of, or in addition to, executing the function or the service, may request the one or more external electronic devices to perform at least part of the function or the service. The one or more external electronic devices receiving the request may perform the at least part of the function or the service requested, or an additional function or an additional service related to the request, and transfer an outcome of the performing to the electronic device **101**. The electronic device **101** may provide the outcome, with or without further processing of the outcome, as at least part of a reply to the request. To that end, a cloud computing, distributed computing, or client-server computing technology may be used, for example.
(41) FIG. **2**A is a front perspective view and a rear perspective view of an electronic device according to an embodiment of the disclosure.
(42) FIG. **2**B is an exploded perspective view of the electronic device illustrated in FIG. **2**A according to an embodiment of the disclosure.
(43) Hereinafter, the same reference numbers are used for the same elements.
(44) According to various embodiments, the electronic device (e.g., the electronic device **101** of FIG. **1**) may include at least one of a transparent display **200** (e.g., the display module **160** of FIG. **1**), a first frame **300**, and a second frame **400**, a housing **500**, and a standing member **600**. The transparent display **200** may be supported by a coupling structure of the first frame **300** and the second frame **400**. The housing **500** and the standing member **600** may be coupled to the first frame **300** and the second frame **400** such that the transparent display **200** is supported at a predetermined angle with respect to the ground. The ground referred to below may refer to a floor surface on which the electronic device is mounted.
(45) According to various embodiments, the transparent display **200** may refer to a display made of a transparent material. The transparent display **200** may be a display capable of transmitting light incident to the transparent display **200** to a surface opposite to the incident surface. The transparent display **200** may display information in both directions of the transparent display **200** (e.g., the front and rear surfaces of the display). The transparent display **200** may be disposed between the first frame **300** and the second frame **400** to be supported by the first frame **300** and the second frame **400**. The transparent display **200** may display information through a first opening **330** of the first frame **300** and a second opening **410** of the second frame **400**. At least a portion of the front surface of the transparent display **200** may be exposed to the outside through the second opening **410** of the second frame **400**, and at least a portion of the rear surface of the first frame **300** may be exposed to the outside through the first opening **330** of the first frame **300**.
(46) According to various embodiments, a display connector **210** may electrically connect the transparent display **200** to a printed circuit board **700**. For example, the display connector **210** may be a flexible printed circuit board (FPCB). The display connector **210** may include a display driver IC (DDI) (e.g., **230** of FIG. **5**C) configured to control driving of pixels included in the transparent display **200**. As shown in FIG. **2**B, the display connector **210** may be connected to the transparent display **200** and disposed on the support **340** of the first frame **300**.

(47) For example, the transparent display **200** may be a transparent organic light emitting diode (T-OLED) type display. The transparent display **200** may include a substrate, a transistor layer, an organic light emitting layer, and/or an electrode. The substrate, the transistor layer, the organic light emitting layer, and/or the electrode included in the transparent display **200** may be made of a transparent material. For example, the substrate may be made of a polymer material or glass which is made of a transparent material. A transistor included in the transistor layer may be a transistor made of a transparent material such as zinc oxide or titanium oxide. The electrode may be formed of a transparent conducting oxide (TCO). For example, the electrode may be made of indium tin oxide (ITO). The organic light emitting layer may include an element that emits light by receiving electric energy. The organic light emitting layer may be made of a transparent material. In addition, the transparent display **200** may be various types of displays. For example, the transparent display **200** may be configured as a transparent liquid crystal display (TLCD) type display.
(48) According to various embodiments, the first frame **300** and the second frame **400** may support the transparent display **200**. The first frame **300** and the second frame **400** may be coupled to each other through a protrusion/groove coupling structure. The first frame **300** and the second frame **400** may be formed of a polymer or metal material having high rigidity to stably support the transparent display **200**. The first frame **300** and the second frame **400** may be formed of the same material or may be formed of different materials.
(49) According to various embodiments, the first frame **300** may include a first region **310** and a second region **320**. The first region **310** may refer to at least a partial region of the upper region of the first frame **300**, and the second region **320** may refer to at least a partial region of the lower region of the first frame **300**. Here, the lower region may refer to a region adjacent to the ground on which the electronic device is mounted, and the upper region may refer to a region farther away from the ground than the lower region. The first opening **330** may be formed in the first region **310**. At least a partial region of the rear surface of the transparent display **200** may be exposed to the outside through the first opening **330**. The support **340** may be formed in the second region **320**. Referring to FIG. **2**B, the support **340** may be formed in a plate shape to fill at least a portion of the second region **320**. The printed circuit board **700** and a sensing member (e.g., the sensing member **3000** of FIG. **9**A), which will be described later, may be disposed on the support **340**.
(50) According to various embodiments, the second opening **410** may be formed through the second frame **400**. The second opening **410** may be formed through the second frame **400** to be at a portion corresponding to the first region **310** and the second region **320** of the first frame **300**. At least a partial region of the front surface of the transparent display **200** may be exposed to the outside through the second opening **410** of the second frame **400**.
(51) According to various embodiments, the housing **500** may include a first housing **510** and a second housing **530**. The first housing **510** and the second housing **530** may be coupled to each other. The housing **500** may be coupled to the first frame **300**. The housing **500** may be coupled to a standing member **600** and the first frame **300** to connect the first frame **300** to the standing member **600**. A first hole **531** and a second hole **533** may be formed in a partial region of the housing **500** such that a first receptacle **910** and a second receptacle **930** can be exposed to the outside. For example, the first hole **531** and the second hole **533** may be formed through the second housing **530**. The first receptacle **910** may be exposed to the outside through the first hole **531**, and the second receptacle **930** may be exposed to the outside through the second hole **533**. The number of holes formed through the housing **500** may be variously changed. For example, three or more holes may also be formed through the housing **500**. In addition, the housing **500** may also be integrally formed without being divided into the first housing **510** and the second housing **530**.
(52) According to various embodiments, the standing member **600** may be coupled to the housing **500**. The standing member **600** may support the housing **500** in an inclined at a predetermined angle with respect to the ground. The housing **500** inclined with respect to the ground by the standing member **600** may be coupled to the first frame **300**. The transparent display **200** supported

by the first frame **300** may also be inclined with respect to the ground.
(53) According to various embodiments, the electronic device may include a printed circuit board **700**. The printed circuit board **700** may include a first printed circuit board **710** and a second printed circuit board **720**. The first printed circuit board **710** may be coupled to the support **340** of the first frame **300**. An antenna structure **714** and a board connector **730** may be disposed on the first printed circuit board **710**. The board connector **730** may electrically connect the first printed circuit board **710** and the second printed circuit board **720** to each other. The first receptacle **910** and the second receptacle **930** may be disposed on the second printed circuit board **720**. The second printed circuit board **720** may be disposed in a space between the first housing **510** and the second housing **530**. According to various embodiments, the printed circuit board **700** may not be divided into the first printed circuit board **710** and the second printed circuit board **720**.
(54) According to various embodiments, a film member **800** may be a film having a glass-like surface. In addition, the film member **800** may be formed of various types of films. For example, the film member **800** may be formed of a polarizing film. The film member **800** may be attached to the support **340** of the first frame **300** through the second opening **410** of the second frame **400**. The film member **800** may prevent the display connector **210** disposed on the support **340** of the first frame **300** from being exposed to the outside to protect the display connector **210**. According to various embodiments, the film member **800** may be formed of a metal plate or a polymer plate instead of a film-type material and coupled to the support **340** of the first frame **300** to protect the display connector **210** disposed on the support **340**.
(55) FIG. **3**A is an exploded perspective view illustrating a transparent display and a support structure thereof according to an embodiment of the disclosure,
(56) FIG. **3**B is a schematic diagram showing a transparent display and a support structure thereof according to an embodiment of the disclosure.
(57) FIG. **3**C is a cross-sectional view, taken along line A-A of FIG. **3**B according to an embodiment of the disclosure.
(58) According to various embodiments, the transparent display **200** and the display connector **210** may be disposed between the first frame **300** and the second frame **400**. The transparent display **200** may display information to the outside through the first opening **330** of the first frame **300** and the second opening **410** of the second frame **400**. The display connector **210** may be disposed on the support **340** of the first frame **300**.
(59) According to various embodiments, the first frame **300** and the second frame **400** may be coupled to each other through a coupling structure having the coupling protrusion **1100** and the coupling groove **1200**. The coupling groove **1200** may include first coupling grooves **1210** formed in the support **340** of the first frame **300**, and second coupling grooves **1220** concavely formed in the second frame **400** to be spaced apart at a predetermined interval along the inner periphery of the second frame **400**. The coupling protrusion **1100** may include first coupling protrusions **1110** protruding from the inner side of the second frame **400** to correspond to the positions where the first coupling grooves **1210** are formed, and second coupling protrusions **1120** protruding from the inner side of the first frame **300** to be spaced apart at a predetermined distance along the outer periphery of the first frame **300**. The first coupling protrusion **1110** and the second coupling protrusion **1120** may be inserted into the first coupling groove **1210** and the second coupling groove **1220**, respectively, such that the first frame **300** and the second frame **400** are coupled to each other.
(60) Referring to FIG. **3**A, the first coupling groove **1210** formed in the plate-shaped support **340** may be formed using a region of the support **340**. The size of the first coupling groove **1210** formed in the support **340** may be larger than the size of the second coupling groove **1220** formed in the inner periphery of the second frame **400**. The first coupling protrusion **1110** corresponding to the first coupling groove **1210** may also be formed to correspond to the size of the first coupling groove **1210**. The first frame **300** and the second frame **400** may be stably coupled to each other by

inserting the first coupling protrusion **1110** of the second frame **400** into the first coupling groove **1210** of the first frame **300**. The first frame **300** and the second frame **400** may be coupled to each other by coupling between the coupling protrusion **1100** and the coupling groove **1200**, and the first frame **300** and the second frame **400** may stably support the transparent display **200**. For example, the first frame **300** and the second frame **400** may stably support the transparent display **200** without sagging or bending of the transparent display **200** even if the transparent display **200** remains at a predetermined angle with respect to the ground.

(61) According to various embodiments, the ground part (not shown) of the printed circuit board **700** disposed on the first frame **300** may be electrically connected to the first coupling protrusion **1110** formed on the second frame **400**. In this case, the second frame **400** may function as a ground of the electronic device.

(62) The second coupling protrusion **1120** and the second coupling groove **1220** shown in FIG. **3**B are only partially illustrated in order to explain the coupling relationship between the first frame **300** and the second frame **400**. According to various embodiments, the plurality of the second coupling protrusion **1120** and the second coupling groove **1220** may be provided as shown in FIG. **3**A.

(63) Referring to FIG. **3**B, the first coupling protrusion **1110** may be formed on the second frame **400**. The first coupling groove **1210** may be formed in the support **340** of the first frame **300**. The second coupling protrusion **1120** may be formed on the first frame **300**. The second coupling groove **1220** may be formed in the second frame **400**. The first coupling protrusion **1110** may be inserted into the first coupling groove **1210**, and the second coupling protrusion **1120** may be inserted into the second coupling groove **1220**, so that the first frame **300** and the second frame **400** may be coupled to each other.

(64) Referring to FIG. **3**C, the second coupling protrusion **1120** of the first frame **300** may be inserted into the second coupling groove **1220** of the second frame **400**. The transparent display **200** may be disposed between the first frame **300** and the second frame **400**. The outer periphery of the transparent display **200** may be inserted into a groove **1300** formed between the first frame **300** and the second frame **400** such that the transparent display **200** is disposed between the first frame **300** and the second frame **400**. According to various embodiments, an adhesive material **1400** may be disposed between the first frame **300** and the second frame **400**. The adhesive material **1400** may subserve the coupling between the second frame **400** and the first frame **300**.

(65) According to various embodiments, the positions where the coupling protrusion **1100** and the coupling groove **1200** are formed may be variously changed. For example, both the first coupling protrusion and the second coupling protrusion may be formed on the first frame, and both the first coupling groove and the second coupling groove may be formed in the second frame. Both the first coupling protrusion and the second coupling protrusion may be formed on the second frame, and both the first coupling groove and the second coupling groove may be formed in the first frame. In addition, the first coupling protrusion and the first coupling groove may be omitted, or the second coupling protrusion and the second coupling groove may also be omitted. According to circumstances, the first frame and the second frame may be coupled to each other in a manner other than the protrusion/groove coupling structure. For example, the first frame and the second frame may be coupled to each other by screw coupling.

(66) FIG. **4** is an exploded perspective view of a housing and a standing member according to an embodiment of the disclosure.

(67) According to various embodiments, the standing member **600** may support the housing **500** in an inclined state with respect to the ground. The standing member **600** may include a non-slip pad **610**. The non-slip pad **610** may prevent the standing member **600** from sliding with respect to the ground. The non-slip pad **610** may be made of a material having a high coefficient of friction. According to various embodiments, the non-slip pad **610** may be made of a material having adhesion to the ground.

(68) According to various embodiments, the housing **500** may be coupled to the first frame **300**. When a hook **511** formed on the housing **500** is inserted into and engaged with a ring (not shown) formed in the first frame **300**, the housing **500** may be coupled to the first frame **300**. When the housing **500** inclined by the standing member **600** is coupled to the first frame **300**, the transparent display **200** supported by the first frame **300** may also remain inclined with respect to the ground. The coupling between the first frame **300** and the housing **500** may be achieved in various manners other than the above-described hook/ring coupling method. For example, the housing **500** and the first frame **300** may be coupled to each other by screw coupling.
(69) According to various embodiments, the second printed circuit board **720** of the printed circuit board **700** may be disposed in a space formed between the first housing **510** and the second housing **530**. The first receptacle **910** and the second receptacle **930** may be disposed on the second printed circuit board **720**. For example, the first receptacle **910** may correspond to a universal serial bus (USB) C-type connector. The second receptacle **930** may correspond to a USB B-type connector. The first receptacle **910** may be exposed to the outside through the first hole **531** of the second housing **530**. The second receptacle **930** may be exposed to the outside through the second hole **533** of the second housing **530**.
(70) According to various embodiments, the standing member **600** may rotatably support the housing **500** so that the angle of the transparent display **200** with respect to the ground may be changed. For example, the standing member **600** and the housing **500** may be hinge-coupled to each other. In addition, a rail structure (not shown) may be formed between the standing member **600** and the housing **500**. In this case, the housing **500** may rotate with respect to the standing member **600** along the rail formed on the standing member **600**. According to various embodiments, the rotation of the housing **500** may be discontinuous. For example, a protrusion/groove structure may be formed between the housing **500** and the rail formed on the standing member **600**. The housing **500** may rotate as the protrusion is separated from the groove by an external force applied thereto, and may stop rotating as the protrusion is inserted into the groove again. Accordingly, the rotation section of the housing **500** may be divided by the protrusion/groove structure.
(71) According to various embodiments, the standing member **600** may include an angle adjustor (not shown) configured to rotate the housing **500** with respect to the standing member **600**. The angle adjustor (not shown) may be, for example, an electric motor. The housing **500** may rotate with respect to the standing member **600** by the driving force of the angle adjustor (not shown). According to the rotation of the housing **500**, the angle of the transparent display **200** may also be changed.
(72) FIGS. **5**A, **5**B, and **5**C show electronic components included in an electronic device and a connection relationship therebetween, according to various embodiments of the disclosure.
(73) FIGS. **5**A and **5**B illustrate the rear surface of the first printed circuit board **710**, and FIG. **5**C illustrates the front surface of the first printed circuit board **710**.
(74) Referring to FIGS. **5**A and **5**C, the first printed circuit board **710** may be disposed on the support **340** of the first frame **300**. The first printed circuit board **710** may be electrically connected to a processing circuitry **713**, an antenna structure **714**, a communication circuitry **716**, a power circuitry **717**, a display power management circuitry **718**, a display connector **210**, an interface circuitry **740**, and a board connector **730**.
(75) Referring to FIG. **5**B, the second printed circuit board **720** may be connected to the first printed circuit board **710** through a board connector **730**. The first receptacle **910** and the second receptacle **930** may be disposed on the second printed circuit board **720**.
(76) According to various embodiments, the processing circuitry **713** may include a processor (e.g., the processor **120** of FIG. **1**) and a memory (e.g., the memory **130** of FIG. **1**). The processor may perform overall control of the electronic device. The memory may store information related to a content reproduced on the transparent display **200**.

(77) According to various embodiments, the antenna structure **714** (e.g., the antenna module **197** of FIG. **1**) may transmit a signal of the communication circuitry **716** to the outside or receive an external signal to transmit the same to the communication circuitry **716**. An antenna line **715** may be formed in the antenna structure **714**. The antenna line **715** may be formed of a conductive material to transmit or receive a communication signal.
(78) According to various embodiments, the communication circuitry **716** (e.g., the communication module **190** of FIG. **1**) may be connected to an external electronic device through a long-range communication network and a short-range communication network. The communication circuitry **716** may process a signal to be transmitted to an external electronic device or receive, through the antenna structure **714**, a signal transmitted from the external electronic device.
(79) According to various embodiments, the power circuitry **717** (e.g., the power management module **188** of FIG. **1**) may manage power supplied to the electronic device.
(80) According to various embodiments, the display power management circuitry **718** may manage power supplied to the transparent display **200**.
(81) According to various embodiments, the interface circuitry **740** (e.g., the interface **177** of FIG. **1**) may process connection to an external electronic device connected to at least one of the first receptacle **910** and the second receptacle **930**. For example, the interface circuitry **740** may include a data unit **741**, a recognition unit **742**, and a power unit **743**. The data unit **741** may receive a signal from an external electronic device and transmit the same to the processor. The recognition unit **742** may detect the type of external electronic device. The power unit **743** may supply power required to drive the external electronic device to the external electronic device, based on the type of external electronic device.
(82) According to various embodiments, the board connector **730** may electrically connect the first printed circuit board **710** and the second printed circuit board **720** to each other.
(83) According to various embodiments, the display connector **210** may electrically connect the transparent display **200** to the first printed circuit board **710**. The display connector **210** may include a display driver IC (DDI) **230** that controls driving of pixels included in the transparent display **200**.
(84) According to various embodiments, a power button **550** may be disposed in the second housing **530**. The power button **550** may include a touch button configured to recognize a user's body touch or a physical button capable of receiving a physical input.
(85) According to various embodiments, the first receptacle **910** or the second receptacle **930** disposed on the second printed circuit board **720** may be connected to an external electronic device. For example, the first receptacle **910** may correspond to a USB C-type connector, and the second receptacle **930** may correspond to a USB B-type connector. As another example, both the first receptacle **910** and the second receptacle **930** may correspond to a USB C-type connector. In addition, both the first receptacle **910** and the second receptacle **930** may correspond to the USB B-type connector.
(86) FIG. **6** is a block diagram of an electronic device according to an embodiment of the disclosure.
(87) According to various embodiments, an external electronic device may be connected to the electronic device through at least one of the first receptacle **910** and the second receptacle **930**. The external electronic device may include an input device such as a mouse and a keyboard, and an external power supply device capable of supplying power to the electronic device.
(88) According to various embodiments, the interface circuitry **740** may be connected to the first receptacle **910** and the second receptacle **930**. The interface circuitry **740** may recognize the type of external electronic device connected to at least one of the first receptacle **910** and the second receptacle **930**. For example, in case that the external electronic device is an input device, the interface circuitry **740** may recognize the type of input device. In case that the input device does not have a separate power source, the interface circuitry **740** may supply power to the input device.

In case that the input device is a mouse, the interface circuitry **740** may transmit a mouse input to the processor **711**. The processor **711** may display a mouse cursor on the transparent display **200** or move the mouse cursor displayed on the transparent display **200**, based on the mouse input transmitted through the interface circuitry **740**.

(89) According to various embodiments, in case that an external power supply device is connected through at least one of the first receptacle **910** and the second receptacle **930**, the interface circuitry **740** may forward the power supplied from the external power supply device to the power circuitry **717**. The power circuitry **717** may convert the applied power into driving power for each electronic component and supply the driving power to the electronic component.

(90) According to various embodiments, a booting command received through the power button **550** may be forwarded to the power circuitry **717**, and the power circuitry **717** may supply power to each electronic component to boot the electronic device.

(91) FIG. **7** is a block diagram of an electronic device according to an embodiment of the disclosure.

(92) FIG. **8** is an operation flowchart of an electronic device according to an embodiment of the disclosure. The operation flowchart shown in FIG. **8** is only an example, and the electronic device according to various embodiments of the disclosure may be operated in various orders other than the operation order shown in FIG. **8**.

(93) According to various embodiments, the interface circuitry **740** may include a data unit **741**, a recognition unit **742**, and a power unit **743**. The first receptacle **910** may correspond to, for example, a USB C-type connector. The first receptacle **910** may be connected to the data unit **741**, the recognition unit **742**, and the power unit **743** of the interface circuitry **740**. The second receptacle **930** may correspond to, for example, a USB B-type connector. The second receptacle **930** may be connected to the power unit **743** of the interface circuitry **740**.

(94) According to various embodiments, the external electronic device may be connected to the electronic device through the first receptacle **910**, and the external power supply device may be connected to the electronic device through the second receptacle **930**.

(95) First, an operation for the case in which an input device is connected to the first receptacle **910** and an external power supply device is connected to the second receptacle **930** will be described.

(96) According to various embodiments, the recognition unit **742** of the interface circuitry **740** may recognize the type of external electronic device connected to the first receptacle **910** at operation **2110**. When the external electronic device connected to the first receptacle **910** is not an external power supply device, the electronic device may receive power through an external power supply device connected to the second receptacle **930** at operation **2140**. A power converter **750** may be disposed between the second receptacle **930** and the interface circuitry **740**. The power converter **750** may convert power input through the second receptacle **930** to suit the electronic device. For example, the power converter may convert a 5V supply to a 4.25V supply. The power input through the second receptacle **930** may be transmitted to the power circuitry **717** through the power unit **743** of the interface circuitry **740**.

(97) According to various embodiments, a booting command **2150** received through the power button **550** may be transmitted to the power circuitry **717**, and the power circuitry **717** may supply the power to each electronic component to boot the electronic device at operation **2160**.

(98) According to various embodiments, the processor **711** may load information related to a content stored in the memory **712** to display the content on the transparent display **200** at operation **2170**.

(99) According to various embodiments, the recognition unit **742** of the interface circuitry **740** may recognize the type of external electronic device connected to the first receptacle **910** at operation **2210**. When the external electronic device is the type of electronic device requiring power at operation **2220**, the power unit **743** of the interface circuitry **740** may supply power to the external electronic device, based on the type of external electronic device by the recognition unit **742** at

operation **2230**. The data unit **741** of the interface circuitry **740** may receive a signal from the external electronic device at operation **2240** and transmit the same to the processor **711**.
(100) According to various embodiments, the processor **711** may control the transparent display **200**, based on the signal from the external electronic device transmitted from the data unit **741** of the interface circuitry **740** at operation **2250**. For example, when the external electronic device is a mouse, the mouse cursor may be displayed on the transparent display **200** or may be moved according to the movement of the mouse.
(101) Next, a case in which the external power supply device is connected to the first receptacle **910** will be described.
(102) According to various embodiments, the recognition unit **742** of the interface circuitry **740** may recognize the type of device connected to the first receptacle **910** at operation **2110**. When the recognition unit **742** recognizes that the first receptacle **910** is connected to the external power supply device and power is supplied through the first receptacle **910** at operation **2120**, the power unit **743** of the interface circuitry **740** may receive the external power supply device supplied through the first receptacle **910**. The power unit **743** may convert the received power and transmit the converted power to the power circuitry **717**.
(103) According to various embodiments, when the recognition unit **742** of the interface circuitry **740** recognizes that the external power supply device is supplied through the first receptacle **910**, the electronic device may be booted at operation **2130**. According to various embodiments, a booting command received through the power button **550** may be transmitted to the power circuitry **717**, and the power circuitry **717** may supply power to each electronic component to boot the electronic device.
(104) According to various embodiments, the processor **711** may load information related to the content stored in the memory **712** and display the content on the transparent display **200** at operation **2170**.
(105) According to various embodiments, the electronic device may include a battery (e.g., the battery **189** of FIG. **1**) for driving the electronic device. When the electronic device includes a battery, the electronic device may operate on its own power without power supplied through the first receptacle **910** or the second receptacle **930**. A booting command received through the power button **550** may be transmitted to the power circuitry **717**, and the power circuitry **717** may supply power to each electronic component to boot the electronic device.
(106) FIGS. **9**A and **9**B illustrate a state in which an electronic device is being used, according to various embodiments of the disclosure.
(107) According to various embodiments, a sensing member **3000** may be disposed on the support **340** of the first frame **300**. The sensing member **3000** may be, for example, at least one of an image sensor, an infrared sensor, and a touch pad. An opening may be formed in the film member **800** covering the support **340** of the first frame **300** in a region corresponding to the region of the support **340** of the first frame **300** where the sensing member **3000** is disposed. The sensing member **3000** may be visually exposed through an opening formed in the film member **800**.
(108) According to various embodiments, the processor (e.g., the processor **711** of FIG. **6**) may control the transparent display **200** or the angle adjustor (not shown), based on information received through the sensing member **3000**.
(109) Referring to FIG. **9**A, the sensing member **3000** may be a touch pad. The sensing member **3000** may sense a user's body touch and the movement of the touched part. The processor may display a cursor **250** on the transparent display **200** or move the cursor **250**, based on the body touch sensed by the sensing member **3000** and movement of the touched part.
(110) Referring to FIG. **9**B, the sensing member **3000** may sense the user's body movement. For example, the sensing member **3000** may sense the user's hand movement. The processor may change the content displayed on the transparent display **200** or control an angle adjustor (not shown), based on the user's hand movement sensed through the sensing member **3000**. As

illustrated in part (a) of FIG. **9**B, when the user's hand moves to the right, the processor may display a following content on the transparent display **200**. As shown in part (b) of FIG. **9**B, when the user's hand moves downward, the processor may control the angle adjustor (not shown) such that the angle between the ground and the transparent display **200** becomes smaller (e.g., change from **01** to **02** as shown in FIG. **9**B). When the user's hand moves upward, the processor may control the angle adjustor (not shown) such that the angle between the ground and the transparent display **200** increases (e.g., change from **02** to **01** as shown in FIG. **9**B).

(111) In addition, the sensing member **3000** may receive various information, and the processor may control the transparent display **200**, based on the information received through the sensing member **3000**.

(112) For example, the sensing member **3000** may detect whether a user approaches the electronic device. When the user's approach is detected through the sensing member **3000**, the processor may activate the transparent display **200** and display a content. When the sensing member **3000** detects the user moving away from the electronic device, the processor may deactivate the transparent display **200** and stop displaying a content.

(113) As another example, the sensing member **3000** may detect the user's eyelid movement. The processor may control the transparent display **200**, based on the user's eyelid movement sensed through the sensing member **3000**. For example, when no user's eyelid movement is detected for a preconfigured time, the processor may deactivate the transparent display **200**. When the user's eyelid movement is detected for a preconfigured time, the processor may maintain the transparent display **200** in an activated state and continue to display a content.

(114) An electronic device according to various embodiments of the disclosure may include a first frame including a first region in which a first opening is formed, and a second region in which a plate-shaped support is formed, a second frame coupled to the first frame and having a second opening formed through a portion corresponding to the first region and the second region of the first frame, a transparent display configured to display information on both surfaces thereof through the first opening of the first frame and the second opening of the second frame and disposed between the first frame and the second frame to be supported by the first frame and the second frame, a housing including a first hole configured to expose a first receptacle to outside of the electronic device, and a second hole configured to expose a second receptacle to the outside of the electronic device, and coupled to at least one of the first frame or the second frame, a standing member configured to support the housing at a predetermined angle so as to enable the transparent display to display information while being inclined at a predetermined angle, and a printed circuit board which is electrically connected to the transparent display and on which electronic components including a processor are disposed.

(115) The first frame and the second frame may be coupled to each other by coupling between a coupling protrusion formed on one of the first frame and the second frame and a coupling groove formed in at least the other one of the first frame and the second frame to correspond to the coupling protrusion.

(116) The coupling groove may include a first coupling groove formed in the plate-shaped support of the first frame, and a second coupling groove formed in a side surface of the first frame, and the coupling protrusion may include a first coupling protrusion formed on an inner surface of the second frame to be inserted into the first coupling groove, and a second coupling protrusion inserted into the second coupling groove.

(117) The standing member may rotatably support the housing so that an angle of the transparent display is variable.

(118) The standing member may include an angle adjustor configured to rotate the housing with respect to the standing member.

(119) The electronic device may further include a sensing member disposed on the plate-shaped support of the first frame so as to receive external information, and the processor may be

configured to control the angle adjustor, based on information received through the sensing member.
(120) The printed circuit board may include a first printed circuit board coupled to the support of the first frame, and a second printed circuit board coupled to the housing.
(121) Power for operating the electronic device may be received through at least one of the first receptacle or the second receptacle, and connection to an external electronic device may be achieved through the other one of the first receptacle and the second receptacle.
(122) One of the first receptacle and the second receptacle may correspond to a universal serial bus (USB) C-type connector, and the other one of the first receptacle and the second receptacle may correspond to a USB B-type connector.
(123) The electronic device may further include an interface circuitry electrically connected to the printed circuit board, capable of detecting a type of an external electronic device connected through at least one of the first receptacle or the second receptacle, and configured to perform, based on the type of the external electronic device, at least one of an operation of supplying power to the external electronic device or an operation of transmitting a signal of the external electronic device to the processor.
(124) The processor may control the transparent display, based on a signal of the external electronic device transmitted from the interface circuitry.
(125) The electronic device may further include a power button configured to receive a booting input of the electronic device, and booting may be performed based on power connected through at least one of the first receptacle or the second receptacle and a booting signal generated from the power button.
(126) The electronic device may further include a sensing member disposed on the support of the first frame to receive external information.
(127) The sensing member may include at least one of an image sensor, an infrared sensor, or a touch pad.
(128) The processor may control the transparent display, based on the information received by the sensing member.
(129) The electronic device may further include a film member attached to the support of the first frame exposed through the second opening of the second frame.
(130) A transparent display support structure a according to various embodiments of the disclosure may include a first frame including a first region in which a first opening is formed, and a second region in which a plate-shaped support is formed, a second frame coupled to the first frame and having a second opening formed through a portion corresponding to the first region and the second region of the first frame, a housing coupled to at least one of the first frame or the second frame, and a standing member configured to support the housing at a predetermined angle, wherein the first frame and the second frame may support the transparent display disposed between the first frame and the second frame and configured to display information on both surfaces thereof through the first opening of the first frame and the second opening of the second frame.
(131) The first frame and the second frame may be coupled to each other by coupling between a coupling protrusion formed on at least one of the first frame or the second frame and a coupling groove formed in the other one of the first frame and the second frame to correspond to the coupling protrusion.
(132) The coupling groove may include a first coupling groove formed in the plate-shaped support of the first frame, and a second coupling groove formed in a side surface of the first frame, and the coupling protrusion may include a first coupling protrusion formed on an inner surface of the second frame to be inserted into the first coupling groove, and a second coupling protrusion inserted into the second coupling groove.
(133) The standing member may rotatably support the housing so that the angle of the transparent display is variable.

(134) While the disclosure has been shown and described with reference to various embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the disclosure as defined by the appended claims and their equivalents.

Claims

1. An electronic device comprising: a first frame comprising a first region in which a first opening is formed, and a second region in which a plate-shaped support is formed; a second frame coupled to the first frame and having a second opening formed through a portion corresponding to the first region and the second region of the first frame; a transparent display configured to display information on both surfaces thereof through the first opening of the first frame and the second opening of the second frame and disposed between the first frame and the second frame to be supported by the first frame and the second frame; a housing comprising a first hole configured to expose a first receptacle to outside of the electronic device, and a second hole configured to expose a second receptacle to the outside of the electronic device and coupled to at least one of the first frame or the second frame; a standing member configured to support the housing at a predetermined angle so as to enable the transparent display to display information while being inclined at a predetermined angle; and a printed circuit board which is electrically connected to the transparent display and on which electronic components comprising a processor are disposed, wherein the first frame and the second frame are coupled to each other by coupling between a plurality of coupling protrusions formed on one of the first frame and the second frame and a plurality of coupling grooves formed in the other one of the first frame and the second frame so as to correspond to the plurality of coupling protrusions, at least two of the plurality of coupling grooves having different sizes from each other, and wherein at least two of the plurality of coupling protrusions have different widths and lengths from each other.
2. The electronic device of claim 1, wherein the plurality of coupling grooves comprise a first coupling groove formed in the plate-shaped support of the first frame, and a second coupling groove formed in a side surface of the second frame, and wherein the plurality of coupling protrusions comprise a first coupling protrusion formed on an inner surface of the second frame to be inserted into the first coupling groove, and a second coupling protrusion formed on the first frame so as to be inserted into the second coupling groove.
3. The electronic device of claim 1, wherein the standing member rotatably supports the housing so that an angle of the transparent display is variable.
4. The electronic device of claim 3, wherein the standing member comprises an angle adjustor configured to rotate the housing with respect to the standing member.
5. The electronic device of claim 4, further comprising: a sensing member disposed on the plate-shaped support of the first frame so as to receive external information, wherein the sensing member comprises at least one of an image sensor, an infrared sensor, or a touch pad, wherein the processor is configured to control the angle adjustor, based on information received through the sensing member.
6. The electronic device of claim 4, wherein the angle adjustor comprises an electric motor.
7. The electronic device of claim 1, wherein the electronic device receives operating power through one of the first receptacle and the second receptacle and achieves a connection to an external electronic device through the other one of the first receptacle and the second receptacle.
8. The electronic device of claim 1, wherein one of the first receptacle and the second receptacle corresponds to a universal serial bus (USB) C-type connector, and wherein the other one of the first receptacle and the second receptacle corresponds to a USB B-type connector.
9. The electronic device of claim 1, further comprising: an interface circuitry electrically connected to the printed circuit board, wherein the interface circuitry is configured to: detect a type of an

external electronic device connected through at least one of the first receptacle or the second receptacle, and perform, based on the type of the external electronic device, at least one of an operation of supplying power to the external electronic device or an operation of transmitting a signal of the external electronic device to the processor.

10. The electronic device of claim 9, wherein the processor is configured to control the transparent display, based on a signal of the external electronic device transmitted from the interface circuitry.

11. The electronic device of claim 1, further comprising: a power button configured to receive a booting input of the electronic device for performing booting based on power connected through at least one of the first receptacle or the second receptacle and a booting signal generated from the power button.

12. The electronic device of claim 1, wherein the printed circuit board is disposed in the first frame and further includes a ground part, and wherein the ground part is electrically connected to a coupling protrusion, of the plurality of coupling protrusions, the coupling protrusion formed on the second frame.

13. A transparent display support structure comprising: a first frame comprising a first region in which a first opening is formed, and a second region in which a plate-shaped support is formed; a second frame coupled to the first frame and having a second opening formed through a portion corresponding to the first region and the second region of the first frame; a housing coupled to at least one of the first frame or the second frame; and a standing member configured to support the housing at a predetermined angle, wherein the first frame and the second frame support a transparent display disposed between the first frame and the second frame and configured to display information on both surfaces thereof through the first opening of the first frame and the second opening of the second frame, wherein the first frame and the second frame are coupled to each other by coupling between a plurality of coupling protrusions formed on one of the first frame and the second frame and a plurality of coupling grooves formed in the other one of the first frame and the second frame so as to correspond to the plurality of coupling protrusions, at least two of the plurality of coupling grooves having different sizes from each other, and wherein at least two of the plurality of coupling protrusions have different widths and lengths from each other.

14. The transparent display support structure of claim 13, wherein the plurality of coupling grooves comprise a first coupling groove formed in the plate-shaped support of the first frame, and a second coupling groove formed in a side surface of the first frame, and wherein the plurality of coupling protrusions comprise a first coupling protrusion formed on an inner surface of the second frame to be inserted into the first coupling groove, and a second coupling protrusion formed on the second frame so as to be inserted into the second coupling groove.

15. The transparent display support structure of claim 13, wherein the standing member rotatably supports the housing so that an angle of the transparent display is variable.

16. An electronic device comprising: a first frame comprising a first region in which a first opening is formed, and a second region in which a plate-shaped support is formed; a second frame coupled to the first frame and having a second opening formed through a portion corresponding to the first region and the second region of the first frame; a transparent display configured to display information on both surfaces thereof through the first opening of the first frame and the second opening of the second frame and disposed between the first frame and the second frame to be supported by the first frame and the second frame; a housing comprising a first hole configured to expose a first receptacle to outside of the electronic device, and a second hole configured to expose a second receptacle to the outside of the electronic device and coupled to at least one of the first frame or the second frame; a standing member configured to support the housing at a predetermined angle so as to enable the transparent display to display information while being inclined at a predetermined angle; and a printed circuit board which is electrically connected to the transparent display and on which electronic components comprising a processor are disposed, wherein the first frame and the second frame are coupled to each other by coupling between a

plurality of coupling protrusions formed on one of the first frame and the second frame and a plurality of coupling grooves formed in the other one of the first frame and the second frame so as to correspond to the plurality of coupling protrusions, wherein the plurality of coupling grooves comprise a first coupling groove formed in the plate-shaped support of the first frame, and a second coupling groove formed in a side surface of the second frame, and wherein the plurality of coupling protrusions comprise a first coupling protrusion formed on an inner surface of the second frame to be inserted into the first coupling groove, and a second coupling protrusion formed on the first frame so as to be inserted into the second coupling groove.