



US 20260254107A1

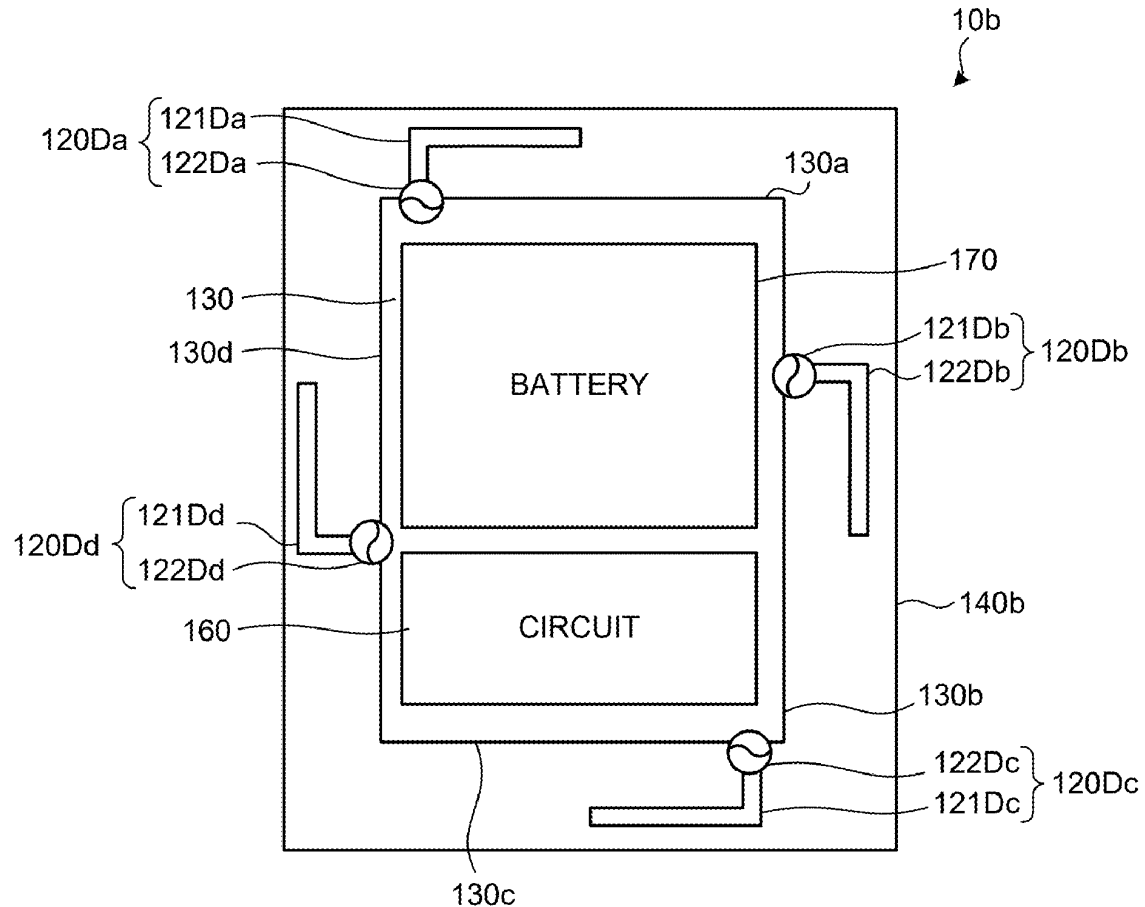
(19) **United States**(12) **Patent Application Publication**
KOBAYASHI(10) **Pub. No.: US 2026/0254107 A1**(43) **Pub. Date: Aug. 27, 2026**(54) **ANTENNA DEVICE AND WIRELESS DEVICE****Publication Classification**(71) Applicant: **SONY GROUP CORPORATION**,
Tokyo (JP)(51) **Int. Cl.**
H01Q 1/52 (2006.01)
H01Q 1/22 (2006.01)(72) Inventor: **Tomoo KOBAYASHI**, Tokyo (JP)(52) **U.S. Cl.**
CPC **H01Q 1/521** (2013.01); **H01Q 1/22**
(2013.01)(21) Appl. No.: **18/870,717**(22) PCT Filed: **May 25, 2023**(86) PCT No.: **PCT/JP2023/019561**

§ 371 (c)(1),

(2) Date: **Dec. 2, 2024**(57) **ABSTRACT**(30) **Foreign Application Priority Data**

Jun. 7, 2022 (JP) 2022-092518

An antenna device of the present disclosure includes a first antenna and a second antenna. The first antenna is provided on one side of a ground, and has a length shorter than one wavelength of an operating frequency. The second antenna, provided on the one side, is an antenna different from the first antenna.





US 20260261034A1

(19) **United States**

(12) **Patent Application Publication**
LI et al.

(10) **Pub. No.: US 2026/0261034 A1**

(43) **Pub. Date: Sep. 3, 2026**

(54) **ANTENNA ASSEMBLY AND ELECTRONIC DEVICE**

(71) Applicant: **Honor Device Co., Ltd.**, Shenzhen (CN)

(72) Inventors: **Shichao LI**, Shenzhen (CN); **Tiezh LIANG**, Shenzhen (CN); **DAWEI ZHOU**, Shenzhen (CN)

(73) Assignee: **Honor Device Co., Ltd.**, Shenzhen (CN)

(21) Appl. No.: **18/846,016**

(22) PCT Filed: **Apr. 27, 2023**

(86) PCT No.: **PCT/CN2023/091094**

§ 371 (c)(1),

(2) Date: **Sep. 11, 2024**

(30) **Foreign Application Priority Data**

Aug. 4, 2022 (CN) 202210934565.1

Publication Classification

(51) **Int. Cl.**

H01Q 1/22 (2006.01)

H01Q 5/378 (2015.01)

H01Q 13/10 (2006.01)

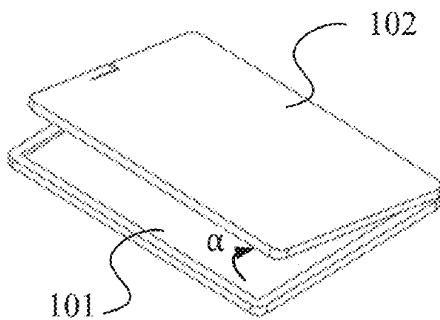
(52) **U.S. Cl.**

CPC **H01Q 1/22** (2013.01); **H01Q 5/378** (2015.01); **H01Q 13/103** (2013.01)

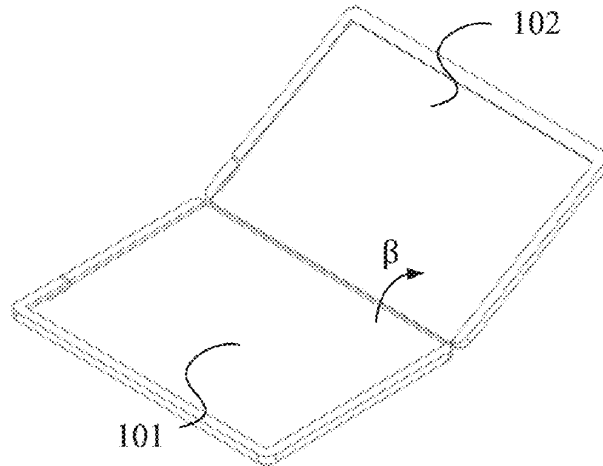
(57)

ABSTRACT

Embodiments of this application provide an antenna assembly and an electronic device. The antenna assembly is applied to a foldable electronic device, and includes: a first antenna disposed on a first body and a second antenna disposed on a second body; the first antenna includes a first end away from a rotating shaft and a second end close to the rotating shaft, a first gap is disposed between the first end and the second end; the second antenna includes a third end away from the rotating shaft and a fourth end close to the rotating shaft, a second gap is disposed between the third end and the fourth end; and when the first body and the second body are in a folded state, the first gap is in an orthographic projection area of the second gap.



A



B



US 20260261035A1

(19) **United States**

(12) **Patent Application Publication**
ZHOU et al.

(10) **Pub. No.: US 2026/0261035 A1**

(43) **Pub. Date: Sep. 3, 2026**

(54) **TERMINAL ANTENNA**

(71) Applicant: **HONOR DEVICE CO., LTD.**,
Shenzhen (CN)

(72) Inventors: **Dawei ZHOU**, Shenzhen (CN);
Yuanpeng LI, Shenzhen (CN)

(21) Appl. No.: **18/881,666**

(22) PCT Filed: **Sep. 5, 2023**

(86) PCT No.: **PCT/CN2023/116998**

§ 371 (c)(1),

(2) Date: **Jan. 6, 2025**

(30) **Foreign Application Priority Data**

Dec. 26, 2022 (CN) 202211676195.2

Publication Classification

(51) **Int. Cl.**

H01Q 1/24 (2006.01)

H01Q 1/38 (2006.01)

H01Q 1/50 (2006.01)

H01Q 9/04 (2006.01)

(52) **U.S. Cl.**

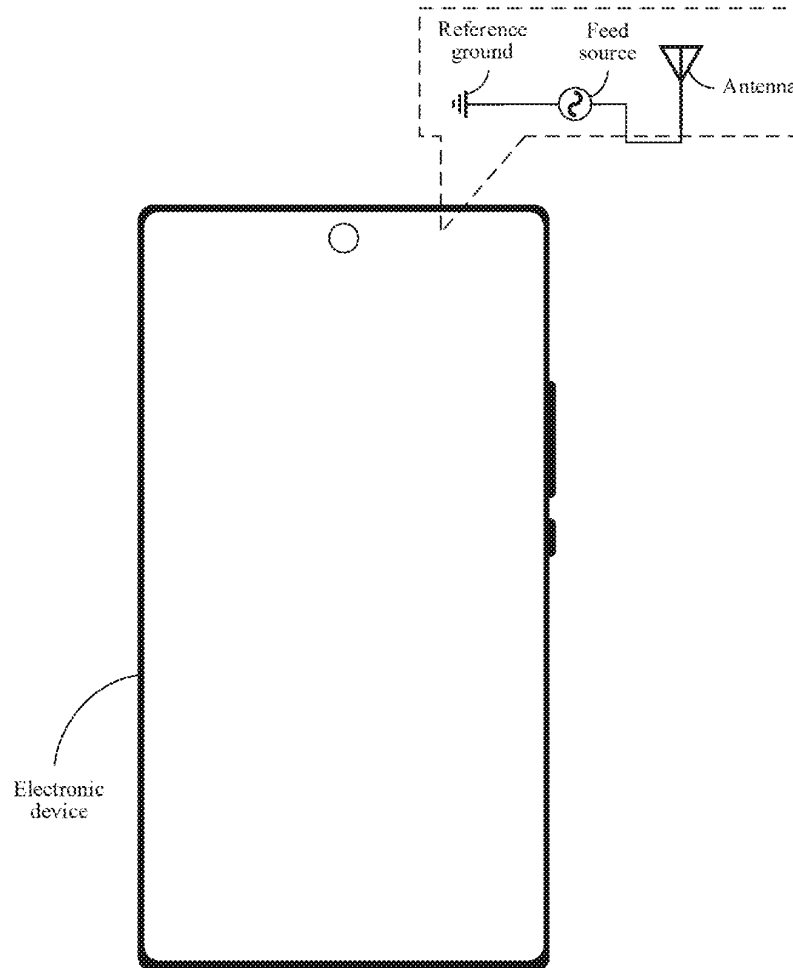
CPC **H01Q 1/243** (2013.01); **H01Q 1/38**

(2013.01); **H01Q 1/50** (2013.01); **H01Q 9/045**

(2013.01)

(57) **ABSTRACT**

Embodiments of this application disclose a terminal antenna, and relate to the field of antenna technologies. Through a design of the present invention, high radiation performance is implemented when a length of a radiator is less than $\frac{1}{2}$ wavelength. In a specific solution, the antenna includes a first radiator, a length of the first radiator is less than a first value, and the first value corresponds to $\frac{1}{2}$ wavelength of an operating frequency of the antenna. A first feed point and a second feed point are disposed at two ends of the first radiator respectively, the first feed point and the second feed point are connected to two signal output ends of a common mode feed structure respectively, the two signal output ends have a same polarity, and the two signals are signals of equal amplitude and in phase.





US 20260269450A1

(19) **United States**

(12) **Patent Application Publication**
LIN et al.

(10) **Pub. No.: US 2026/0269450 A1**

(43) **Pub. Date: Sep. 10, 2026**

(54) **QUICK-DETACHABLE ANTENNA SIGNAL TRANSMISSION MODULE AND METHOD FOR MANUFACTURING THE SAME**

(52) **U.S. Cl.**
CPC **H01Q 1/088** (2013.01); **H01Q 1/14** (2013.01)

(71) Applicant: **INPAQ TECHNOLOGY CO., LTD.**,
MIAOLI COUNTY (TW)

(72) Inventors: **CHIH-CHEN LIN**, New Taipei City (TW); **XIAN-XIU HONG**, Taoyuan City (TW); **JUNG-MOU CHENG**, New Taipei City (TW)

(21) Appl. No.: **19/171,337**

(22) Filed: **Apr. 6, 2025**

(30) **Foreign Application Priority Data**

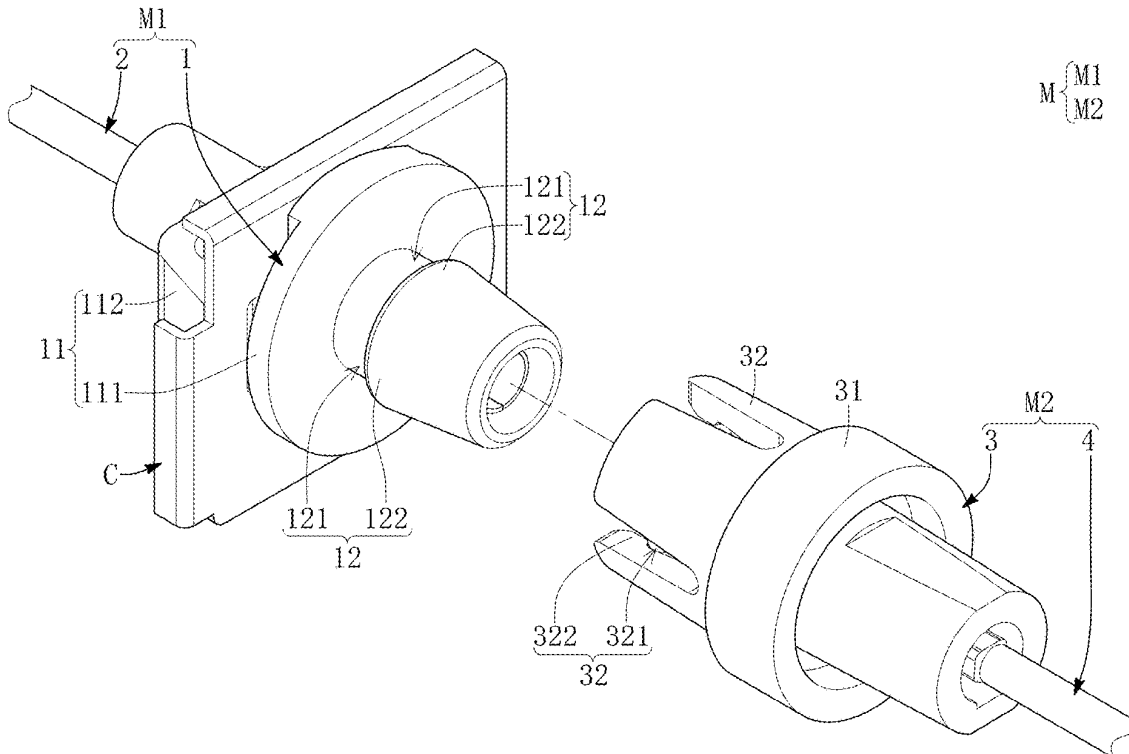
Mar. 7, 2025 (TW) 114108497

Publication Classification

(51) **Int. Cl.**
H01Q 1/08 (2006.01)
H01Q 1/14 (2006.01)

(57) **ABSTRACT**

A quick-detachable antenna signal transmission module and a method for manufacturing the same. The quick-detachable antenna signal transmission module includes a first antenna signal transmission structure and a second antenna signal transmission structure. The first antenna signal transmission structure includes a first quick-release structure matching casing and a first quick-release signal transmission assembly partially enclosed by the first quick-release structure matching casing. The second antenna signal transmission structure includes a second quick-release structure matching casing and a second quick-release signal transmission assembly partially enclosed by the second quick-release structure matching casing. When the first quick-release structure matching casing is configured to be fixed on an electronic product housing, the second quick-release structure matching casing is configured to be detachably connected to the first quick-release structure matching casing, and the second quick-release signal transmission assembly is configured to be detachably connected to the first quick-release signal transmission assembly.





US 20260269456A1

(19) **United States**

(12) **Patent Application Publication**
YOKOYAMA et al.

(10) **Pub. No.: US 2026/0269456 A1**

(43) **Pub. Date: Sep. 10, 2026**

(54) **ANTENNA MODULE AND METHOD FOR
MANUFACTURING THE SAME**

(71) Applicant: **Murata Manufacturing Co., Ltd.,**
Nagaokakyo-shi (JP)

(72) Inventors: **Michiharu YOKOYAMA,**
Nagaokakyo-shi (JP); **Hiroki**
YOSHIMORI, Nagaokakyo-shi (JP);
Atsushi KASUYA, Nagaokakyo-shi
(JP); **Yukiya HIRAOKA,**
Nagaokakyo-shi (JP); **Keisei**
TAKAYAMA, Nagaokakyo-shi (JP);
Hideki UEDA, Nagaokakyo-shi (JP)

(73) Assignee: **Murata Manufacturing Co., Ltd.,**
Nagaokakyo-shi (JP)

(21) Appl. No.: **19/672,795**

(22) Filed: **May 11, 2026**

Related U.S. Application Data

(63) Continuation-in-part of application No. PCT/JP2024/
042034, filed on Nov. 27, 2024.

(30) **Foreign Application Priority Data**

Nov. 27, 2023 (JP) 2023-200220

Publication Classification

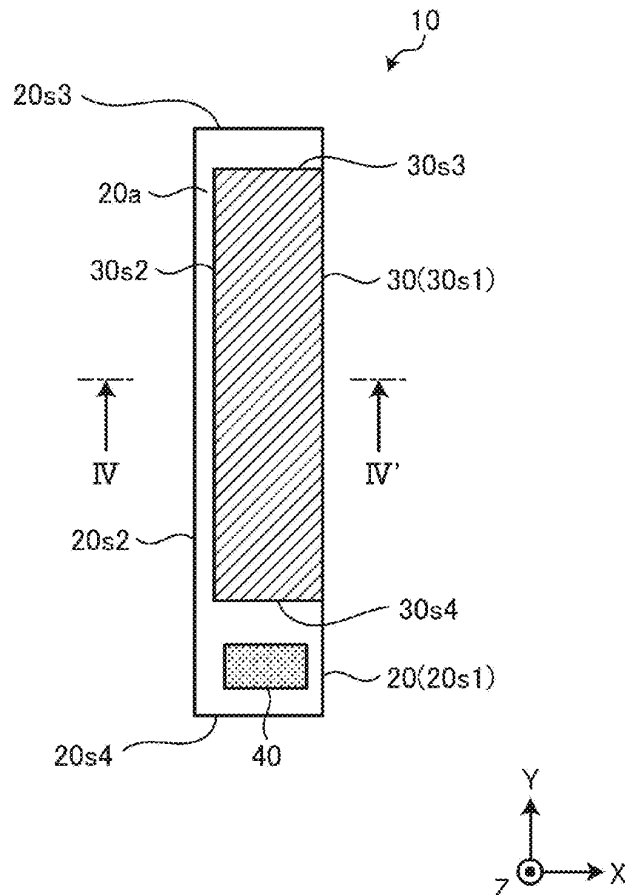
(51) **Int. Cl.**
H01Q 1/22 (2006.01)

H01Q 21/00 (2006.01)

(52) **U.S. Cl.**
CPC **H01Q 1/2283** (2013.01); **H01Q 1/2208**
(2013.01); **H01Q 21/0087** (2013.01)

(57) **ABSTRACT**

An antenna module includes an antenna substrate, at least one radiation electrode on the antenna substrate, and a radio-frequency circuit module on the antenna substrate, wherein the radio-frequency circuit module has a rectangular shape with first through fourth module side surfaces, the first and second module side surfaces corresponding to the two long sides of the rectangular shape, and wherein the antenna substrate has first through fourth substrate side surfaces, the first substrate side surface being coplanar with or located inward from the first module side surface in plan view, and at least one of the second through fourth substrate side surfaces being in a region that does not overlap the radio-frequency circuit module in plan view.





US 20260269457A1

(19) **United States**

(12) **Patent Application Publication**

Xue et al.

(10) **Pub. No.: US 2026/0269457 A1**

(43) **Pub. Date: Sep. 10, 2026**

(54) **ELECTRONIC DEVICE**

(71) Applicant: **Huawei Technologies Co., Ltd.**,
Shenzhen (CN)

(72) Inventors: **Liang Xue**, Shanghai (CN); **Yuan Zhou**, Shanghai (CN); **Zhiyuan Xie**,
Shanghai (CN); **Dong Yu**, Shanghai (CN); **Jikang Wang**, Shanghai (CN);
Huatao Liu, Shanghai (CN); **Chi Fan**, Xi'an (CN)

(21) Appl. No.: **19/662,408**

(22) Filed: **Apr. 29, 2026**

Related U.S. Application Data

(63) Continuation of application No. PCT/CN2025/089506, filed on Apr. 17, 2025.

(30) **Foreign Application Priority Data**

Apr. 28, 2024 (CN) 202410544831.9

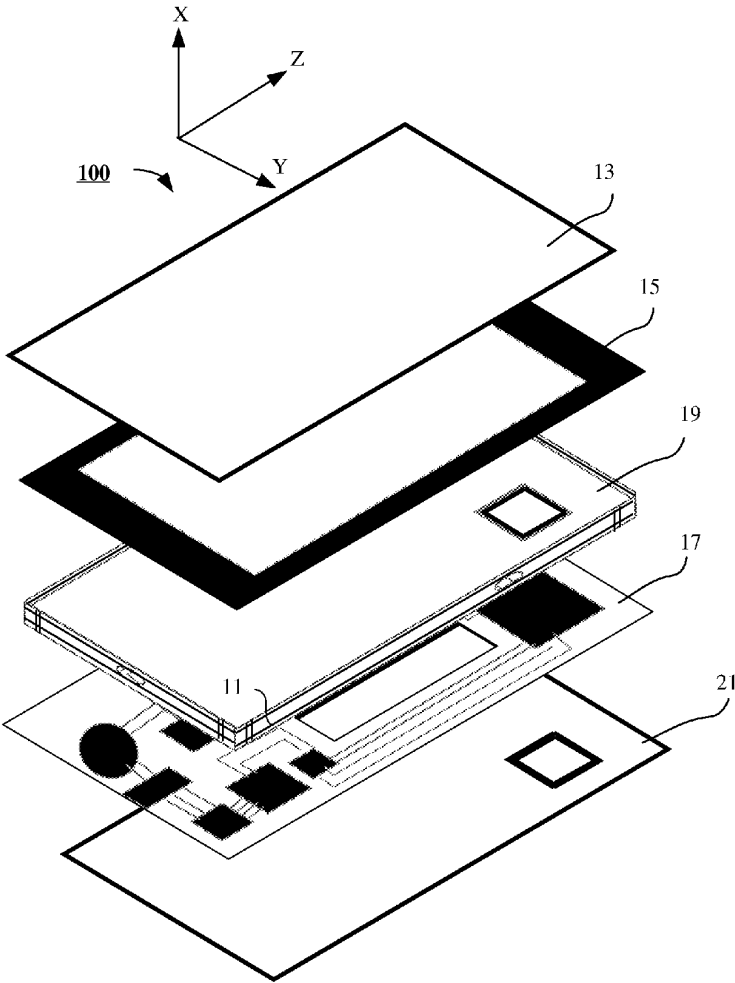
Publication Classification

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
G06F 1/16 (2006.01)
H01Q 1/38 (2006.01)
H01Q 1/50 (2006.01)

(52) **U.S. Cl.**
CPC **H01Q 1/243** (2013.01); **G06F 1/1616** (2013.01); **G06F 1/1641** (2013.01); **G06F 1/1652** (2013.01); **G06F 1/1698** (2013.01); **H01Q 1/38** (2013.01); **H01Q 1/50** (2013.01)

(57) **ABSTRACT**

Embodiments of this application provide an electronic device. The electronic device includes a first antenna and a second antenna. The first antenna uses conductive parts of a side frame of a first housing as a first radiator and a parasitic stub. The second antenna uses a conductive part of a side frame of a second housing as a second radiator, and the second radiator and the parasitic stub are adjacently disposed. The electronic device may be a foldable electronic device.





US 20260269466 A1

(19) **United States**
(12) **Patent Application Publication**
SUN et al.

(10) **Pub. No.:** **US 2026/0269466 A1**
(43) **Pub. Date:** **Sep. 10, 2026**

(54) **ANTENNA STRUCTURE**

(52) **U.S. Cl.**

(71) Applicant: **WNC Corporation, Hsinchu (TW)**

CPC **H01Q 1/50** (2013.01); **G01D 5/20** (2013.01); **H01Q 1/22** (2013.01)

(72) Inventors: **Tzu-Kuan SUN, Hsinchu (TW);**
Chung-Che LIEN, Hsinchu (TW)

(57) **ABSTRACT**

(21) Appl. No.: **19/535,223**

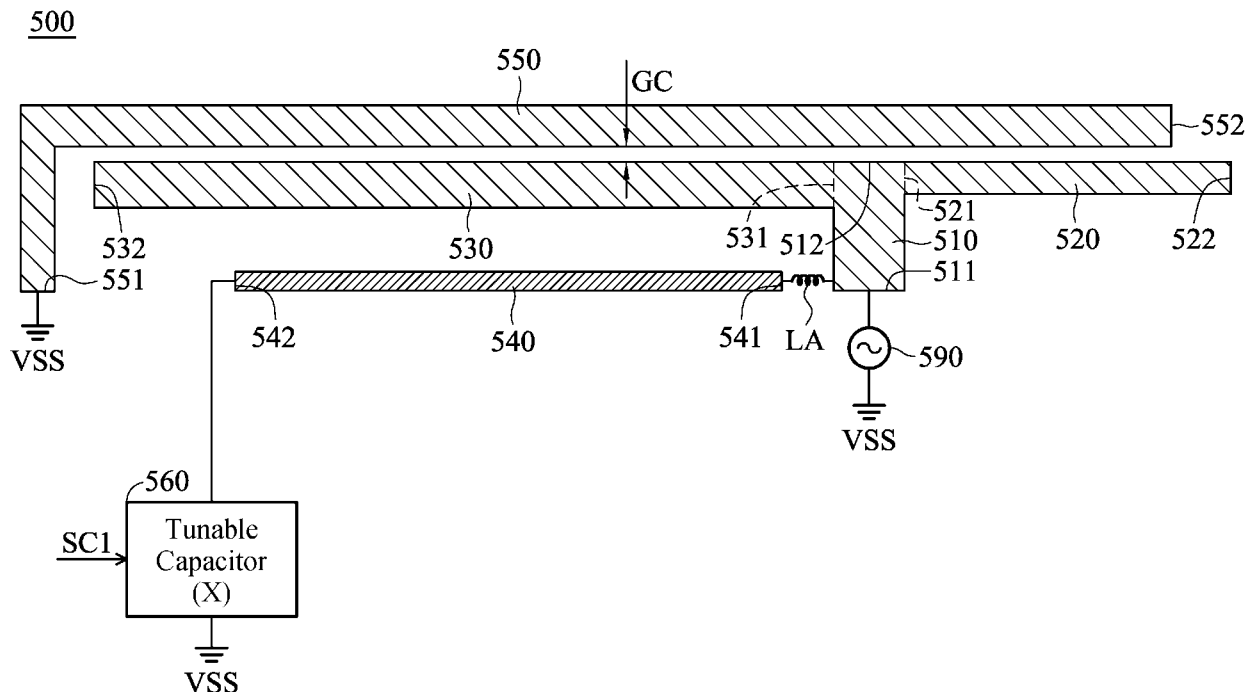
An antenna structure includes a first radiation element, a second radiation element, a third radiation element, a connection metal element, a tunable capacitor, a first capacitor, a second capacitor, and a first inductor. The first radiation element is coupled through the first capacitor to a signal source. The second radiation element is coupled to the first radiation element. The second radiation element is also coupled through the second capacitor to a ground voltage. The third radiation element is coupled to the first radiation element. The connection metal element is coupled through the first inductor to the first radiation element or the second radiation element. The tunable capacitor generates a variable capacitance according to a first control signal. The connection metal element is also coupled through the tunable capacitor to the ground voltage.

(22) Filed: **Feb. 10, 2026**

(30) **Foreign Application Priority Data**
Mar. 7, 2025 (TW) 114108472

Publication Classification

(51) **Int. Cl.**
H01Q 1/50 (2006.01)
G01D 5/20 (2006.01)
H01Q 1/22 (2006.01)





US 20260269467A1

(19) **United States**

(12) **Patent Application Publication**
YU et al.

(10) **Pub. No.: US 2026/0269467 A1**

(43) **Pub. Date: Sep. 10, 2026**

(54) **ELECTRONIC DEVICE COMPRISING
ANTENNA**

Publication Classification

(71) Applicant: **SAMSUNG ELECTRONICS CO.,
LTD.**, Suwon-si (KR)

(51) **Int. Cl.**
H01Q 1/52 (2006.01)
H01Q 1/24 (2006.01)
H01Q 1/42 (2006.01)

(72) Inventors: **Changha YU**, Suwon-si (KR);
Mincheol SEO, Suwon-si (KR);
Jaebong CHUN, Suwon-si (KR);
Woosuk KANG, Suwon-si (KR);
Ohheon KWON, Suwon-si (KR);
Gyubok PARK, Suwon-si (KR);
Sumin YUN, Suwon-si (KR); **Sangmok
LEE**, Suwon-si (KR)

(52) **U.S. Cl.**
CPC **H01Q 1/52** (2013.01); **H01Q 1/241**
(2013.01); **H01Q 1/42** (2013.01)

(21) Appl. No.: **19/566,460**

(22) Filed: **Mar. 13, 2026**

Related U.S. Application Data

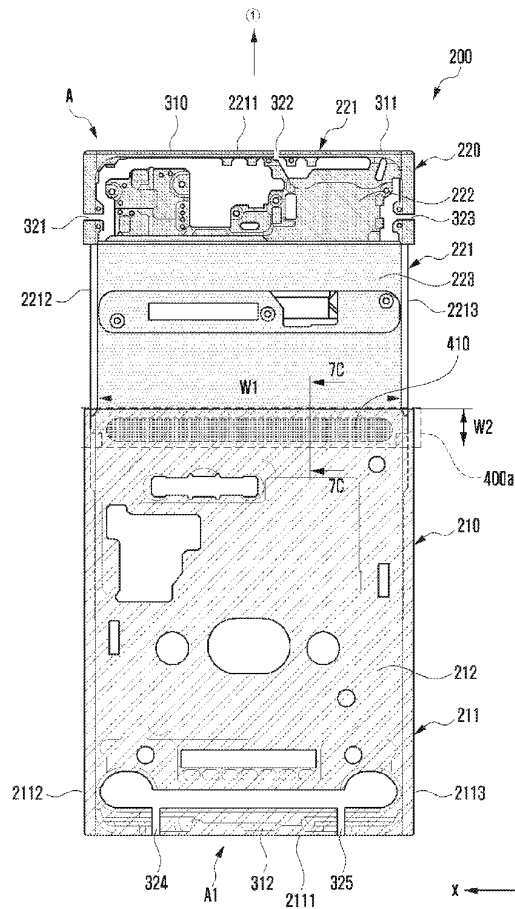
(63) Continuation of application No. PCT/KR2024/
012857, filed on Aug. 28, 2024.

(30) Foreign Application Priority Data

Sep. 14, 2023 (KR) 10-2023-0122608
Oct. 31, 2023 (KR) 10-2023-0147963

(57) ABSTRACT

An electronic device may include: a first housing including a conductive material; a second housing slidably coupled to the first housing, including at least one first conductive portion, and including a conductive material; a communication circuit disposed in an inner space of the electronic device and configured to transmit and/or receive wireless signals in a first frequency band through the at least one first conductive portion; and at least one dielectric disposed between the first housing and the second housing, wherein in a slide-out state, the electronic device includes an overlapping area where the first housing and the second housing at least partially overlap each other, and the at least one dielectric may be disposed in the overlapping area.





US 20260269471A1

(19) **United States**(12) **Patent Application Publication**
ZHAO et al.(10) **Pub. No.: US 2026/0269471 A1**(43) **Pub. Date: Sep. 10, 2026**(54) **ANTENNA ASSEMBLY FOR USE IN A COMMUNICATION DEVICE**(71) Applicant: **Thomson Licensing**, Cesson-Sevigne (FR)(72) Inventors: **Lizhi ZHAO**, Beijing (CN); **Ke DAI**, Beijing (CN)(21) Appl. No.: **18/871,830**(22) PCT Filed: **Jun. 16, 2022**(86) PCT No.: **PCT/CN2022/099202**

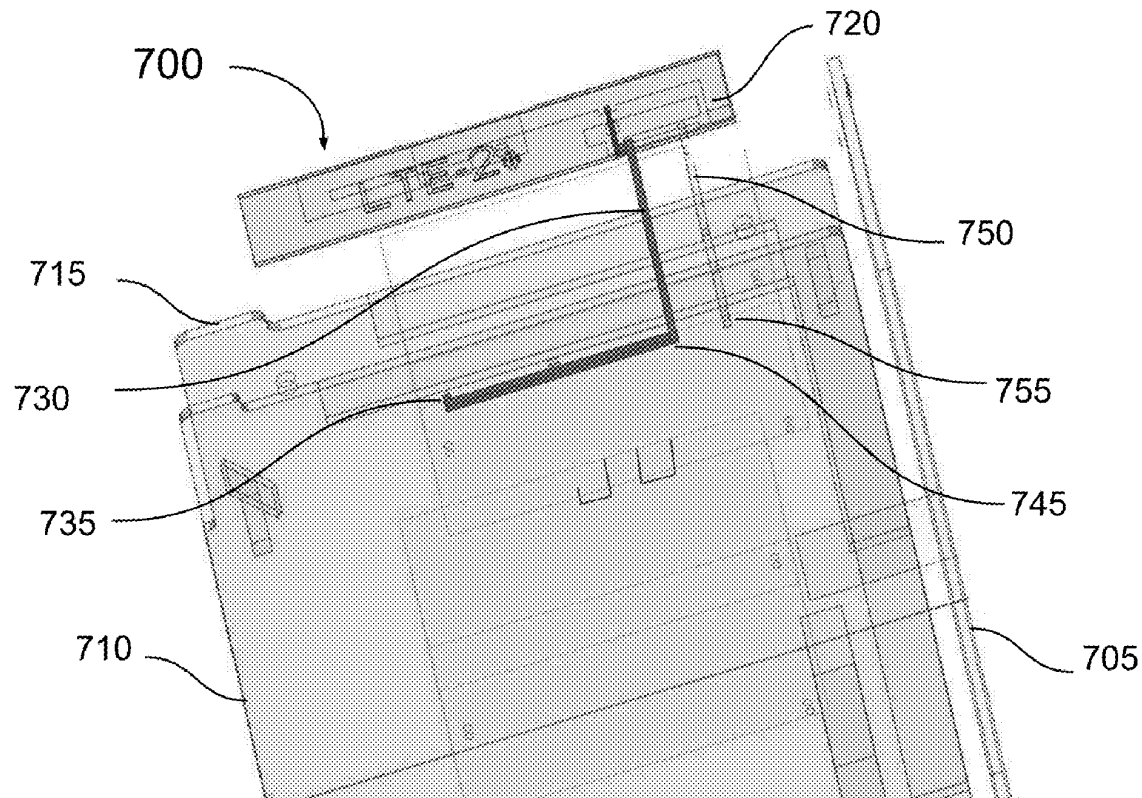
§ 371 (c)(1),

(2) Date: **Dec. 5, 2024****Publication Classification**(51) **Int. Cl.**
H01Q 5/30 (2015.01)
H01Q 1/22 (2006.01)
H01Q 5/20 (2015.01)(52) **U.S. Cl.**CPC **H01Q 5/30** (2015.01); **H01Q 1/22** (2013.01); **H01Q 5/20** (2015.01)

(57)

ABSTRACT

An apparatus and accompanying antenna assembly is described. The apparatus includes a circuit that processes a communication signal received and/or transmitted wirelessly over a network and an antenna assembly. The antenna assembly includes an antenna structure operating in a first frequency range and a second frequency range that is different from the first frequency range. The antenna assembly includes a first and second conductive element each coupled at one end to a first end and second end of a conductive ground element on the antenna structure. The first and second elements each extend outward in a direction perpendicular to the ground element and away from the antenna structure, the second element extending parallel to the first element. The first and second element form a ground plane extension for the antenna structure improving the performance of the antenna assembly in the first frequency range and/or the second frequency range.





US 20260269476 A1

(19) **United States**
(12) **Patent Application Publication**
Vadeyanapur et al.

(10) **Pub. No.:** **US 2026/0269476 A1**
(43) **Pub. Date:** **Sep. 10, 2026**

(54) **ANTENNA**

(71) Applicant: **NXP B.V.**, Eindhoven (NL)

(72) Inventors: **Shambulingappa Vadeyanapur**,
Hirekerur (IN); **Levent Gurel**,
Menlo Park, CA (US)

(21) Appl. No.: **19/560,834**

(22) Filed: **Mar. 9, 2026**

(30) **Foreign Application Priority Data**

Mar. 10, 2025 (IN) 202541021410

Publication Classification

(51) **Int. Cl.**

H01Q 9/04 (2006.01)
H01Q 1/42 (2006.01)
H01Q 13/18 (2006.01)

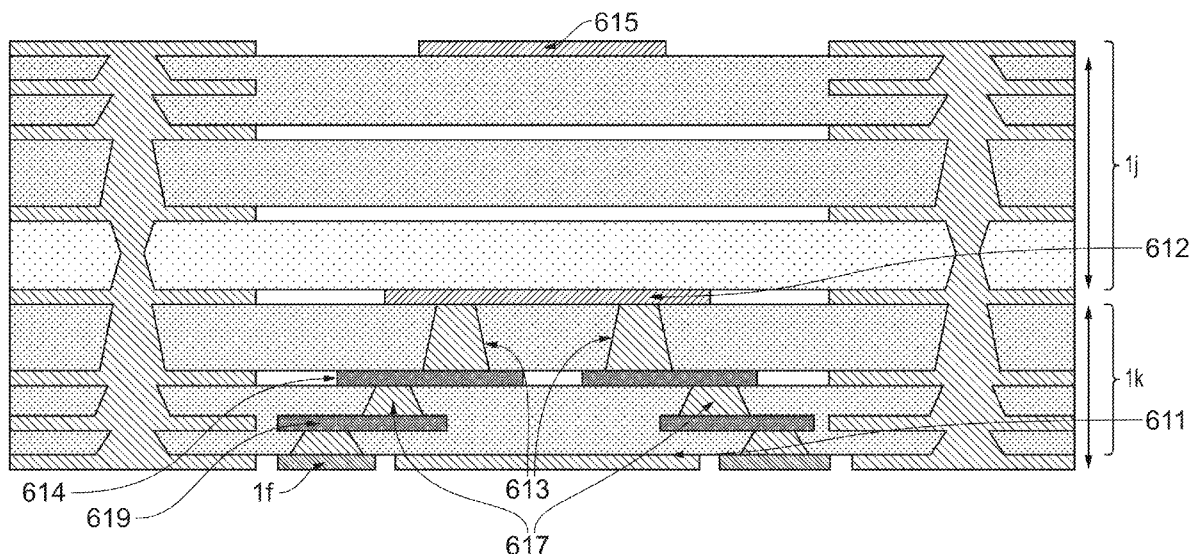
(52) **U.S. Cl.**

CPC **H01Q 9/0414** (2013.01); **H01Q 1/422**
(2013.01); **H01Q 13/18** (2013.01)

(57)

ABSTRACT

An integrated patch antenna with a plurality of layers, comprising: a reference plane, positioned in a first layer, wherein the reference plane is configured to provide a connection to a reference voltage; a driving patch, positioned in a second layer, wherein the first layer is separated from the second layer by a plurality of layers, such that: the driving patch is positioned above the reference plane, a volume between the reference plane and the driving patch defines a first resonant cavity, and the integrated patch antenna comprises a plurality of layers within the first resonant cavity. The integrated patch antenna also comprises a feed line configured to connect the driving patch to a transmitter or receiver, comprising: a first conductive via positioned in the first resonant cavity, galvanically connected to the driving patch; and a first conductive trace, galvanically connected to the first conductive via.





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(19) **United States**

(12) **Patent Application Publication**
Magray et al.

(10) **Pub. No.: US 2026/0269483 A1**

(43) **Pub. Date: Sep. 10, 2026**

(54) **CAVITY-BACKED SLOT ANTENNA DEVICE**

(52) **U.S. Cl.**

(71) Applicant: **ASUSTeK COMPUTER INC.**, Taipei
City (TW)

CPC **H01Q 13/18** (2013.01); **H01Q 1/38**
(2013.01); **H01Q 13/106** (2013.01)

(72) Inventors: **Muhammad Idrees Magray**, Taipei
City (TW); **Peng-Hao Juan**, Taipei City
(TW)

(57)

ABSTRACT

(21) Appl. No.: **19/539,505**

(22) Filed: **Feb. 13, 2026**

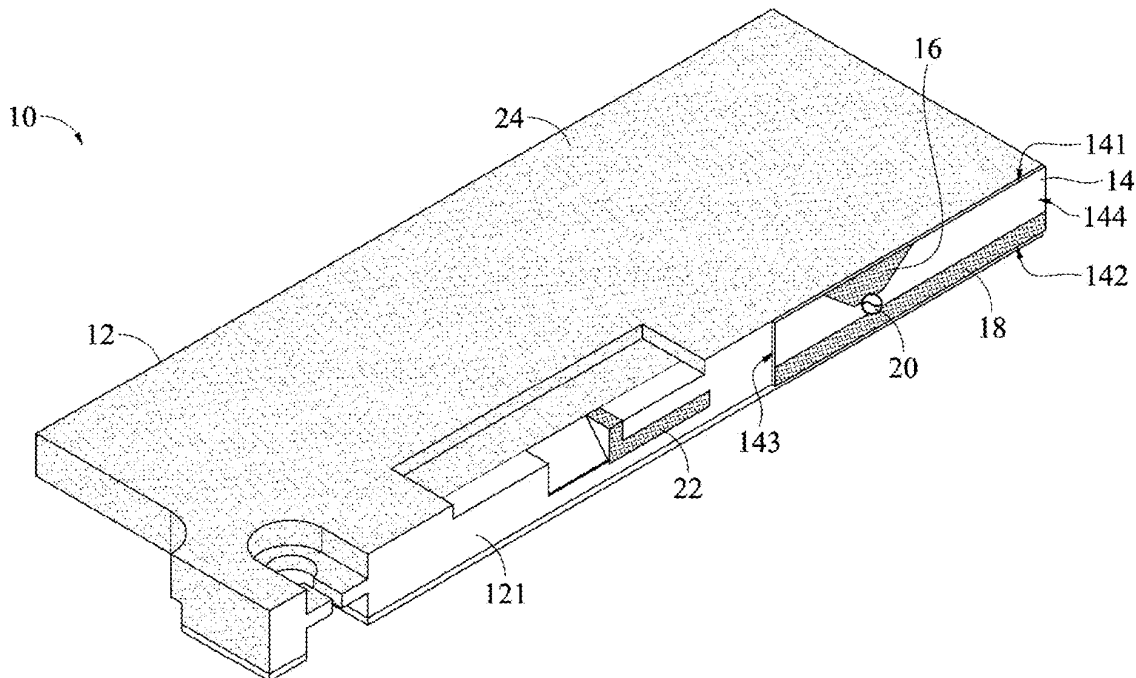
(30) **Foreign Application Priority Data**

Mar. 4, 2025 (TW) 114107979

A cavity-backed slot antenna device disposed in a metal casing is provided. The cavity-backed slot antenna device comprises a first cavity, an antenna substrate, a feed metal branch, a signal feed source, and a coupling metal branch. The first cavity of the cavity-backed slot antenna device includes a metal surface, and a non-conductive plane is provided on an open side of the first cavity. The first cavity is electrically connected to the metal casing and the non-conductive plane corresponds to an elongated opening of the metal casing. The antenna substrate is disposed on the non-conductive plane. The feed metal branch is disposed on the antenna substrate. The signal feed source is disposed on the antenna substrate and electrically connected to the feed metal branch. The coupling metal branch is disposed on the non-conductive plane and spaced apart from the antenna substrate to correspond to the signal feed source.

Publication Classification

(51) **Int. Cl.**
H01Q 13/18 (2006.01)
H01Q 1/38 (2006.01)
H01Q 13/10 (2006.01)





US 20260269486A1

(19) **United States**(12) **Patent Application Publication**
Ma et al.(10) **Pub. No.: US 2026/0269486 A1**(43) **Pub. Date: Sep. 10, 2026**(54) **ELECTRONIC DEVICE**(71) Applicant: **Honor Device Co., Ltd.**, Shenzhen
(CN)(72) Inventors: **Ning Ma**, Shenzhen (CN); **Guolong Wang**, Shenzhen (CN); **Xiaotao Cai**, Shenzhen (CN); **Chao Feng**, Shenzhen (CN); **Dawei Zhou**, Shenzhen (CN)(21) Appl. No.: **19/657,918**(22) Filed: **Apr. 24, 2026****Related U.S. Application Data**

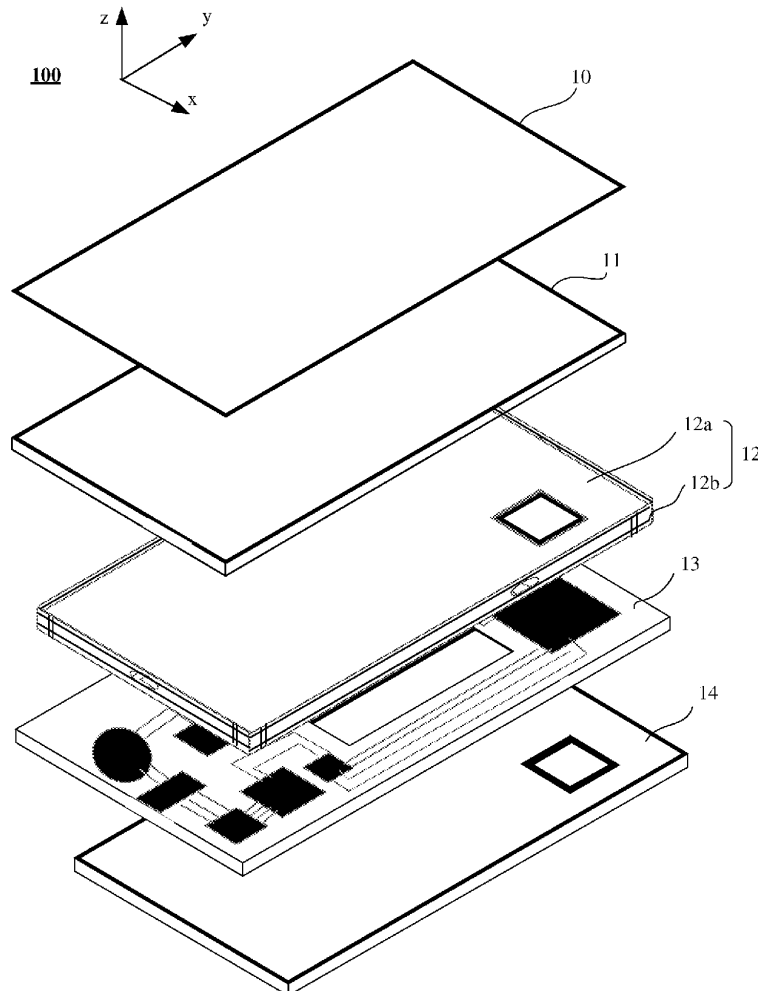
(63) Continuation of application No. PCT/CN2023/142156, filed on Dec. 26, 2023.

Publication Classification(51) **Int. Cl.**
H01Q 15/24 (2006.01)
H01Q 1/24 (2006.01)**H01Q 1/36** (2006.01)**H01Q 1/48** (2006.01)**H01Q 9/02** (2006.01)(52) **U.S. Cl.**CPC **H01Q 15/24** (2013.01); **H01Q 1/243** (2013.01); **H01Q 1/36** (2013.01); **H01Q 1/48** (2013.01); **H01Q 9/02** (2013.01)

(57)

ABSTRACT

This application relates to the antenna field, and provides an electronic device. The electronic device includes an antenna structure. The antenna structure includes two radiators that are mutually non-contacting. A first radiator is disposed on a side of a ground plane (for example, a part of a bezel may be formed as the first radiator). A second radiator is disposed above and parallel to the ground plane. The antenna structure is fed by using a feed point disposed on at least one radiator, so that the two radiators perform energy coupling to radiate an electromagnetic wave. In addition, the antenna structure can generate electric field components in two directions (for example, an x-direction and a z-direction) that are perpendicular to each other.





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(19) **United States**
(12) **Patent Application Publication**
Lai et al.

(10) **Pub. No.:** **US 2026/0280098 A1**
(43) **Pub. Date:** **Sep. 17, 2026**

(54) **ELECTRONIC DEVICE**

Publication Classification

(71) Applicant: **Huawei Technologies Co., Ltd.,**
Shenzhen (CN)

(72) Inventors: **Ben Lai**, Wuhan (CN); **Siting Li**,
Wuhan (CN); **Feng Tian**, Wuhan
(CN); **Fan Cao**, Wuhan (CN);
Shijun Zhang, Wuhan (CN)

(21) Appl. No.: **19/669,512**

(22) Filed: **May 6, 2026**

Related U.S. Application Data

(63) Continuation of application No. PCT/CN2025/087633,
filed on Apr. 8, 2025.

Foreign Application Priority Data

Apr. 30, 2024 (CN) 202410557549.4

(51) **Int. Cl.**

H01Q 1/22 (2006.01)
H01Q 1/02 (2006.01)
H01Q 1/14 (2006.01)
H01Q 1/38 (2006.01)
H05K 1/02 (2006.01)
H05K 1/14 (2006.01)
H05K 1/189 (2026.01)

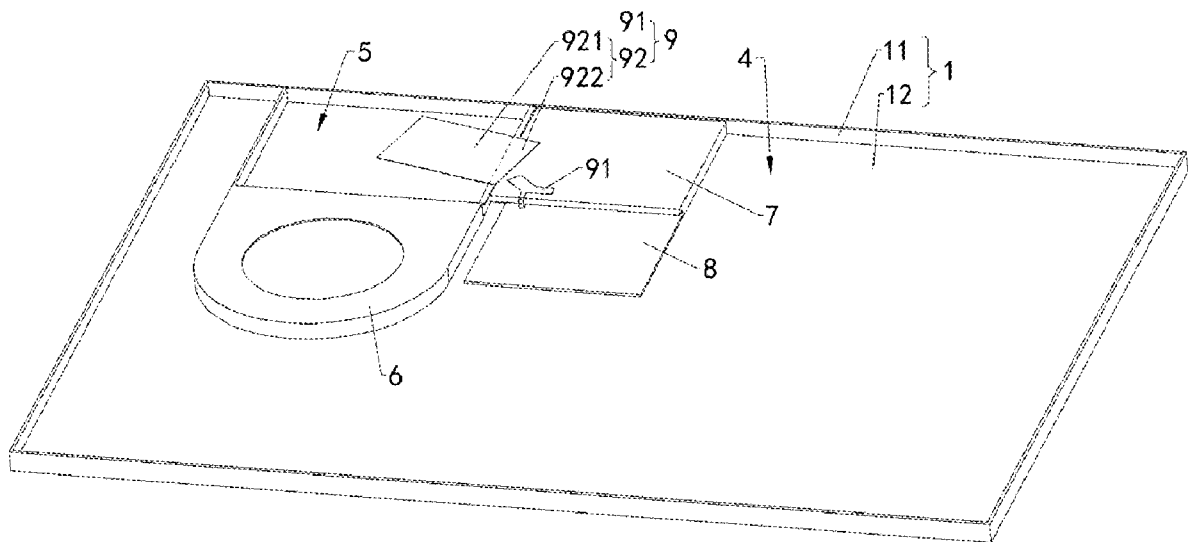
(52) **U.S. Cl.**

CPC **H01Q 1/22** (2013.01); **H01Q 1/02**
(2013.01); **H01Q 1/14** (2013.01); **H01Q**
1/38 (2013.01); **H05K 1/0284** (2013.01);
H05K 1/147 (2013.01); **H05K 1/189**
(2013.01); **H05K 2201/056** (2013.01);
H05K 2201/10128 (2013.01)

(57)

ABSTRACT

A rear cover is fastened to one side of a middle frame, and an inner cavity and an air duct are formed between the rear cover and the middle frame. Both a circuit board and a support member are mounted in the inner cavity. A first antenna sub-portion is fastened to one side of the support member and that faces the rear cover, and is electrically connected to the circuit board. A second antenna sub-portion is fastened to one side of the rear cover and that faces the middle frame, or is a part of the rear cover, and is at least partially located in the air duct. A region of the rear cover and that directly faces the second antenna sub-portion is a non-signal shielding region.





US 20260280099A1

(19) **United States**

(12) **Patent Application Publication**
ZHANG et al.

(10) **Pub. No.: US 2026/0280099 A1**

(43) **Pub. Date: Sep. 17, 2026**

(54) **CAVITY ANTENNA AND ELECTRONIC
DEVICE**

Publication Classification

(71) Applicant: **Honor Device Co., Ltd.**, Shenzhen
(CN)

(51) **Int. Cl.**
H01Q 1/22 (2006.01)

(72) Inventors: **Aofang ZHANG**, Shenzhen (CN);
Yang LU, Shenzhen (CN); **Shaojie
CHU**, Shenzhen (CN); **Ning MA**,
Shenzhen (CN)

(52) **U.S. Cl.**
CPC **H01Q 1/22** (2013.01)

(57) **ABSTRACT**

(21) Appl. No.: **19/677,138**

This application provides a cavity antenna and an electronic device. The cavity antenna includes a metal backplane, a dielectric substrate, and a flexible printed circuit board. The dielectric substrate is located between the flexible printed circuit board and the metal backplane. The flexible printed circuit board is electrically connected to the metal backplane. The flexible printed circuit board includes a body part and a bending plate. The body part is provided with an avoidance hole. The avoidance hole is spaced apart from a peripheral surface of the body part. The bending plate is fixedly connected to a hole wall of the avoidance hole and is bendable relative to the body part. When the bending plate is bent relative to the body part, the bending plate is electrically connected to the metal backplane.

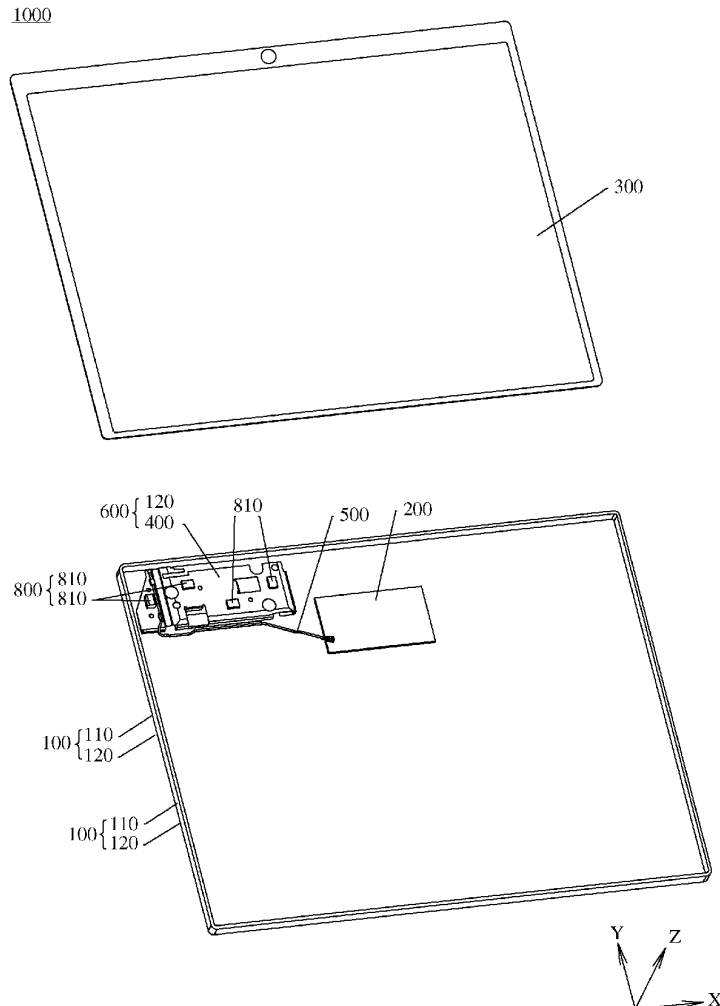
(22) Filed: **May 14, 2026**

Related U.S. Application Data

(63) Continuation of application No. PCT/CN2024/
106736, filed on Jul. 22, 2024.

(30) **Foreign Application Priority Data**

Nov. 15, 2023 (CN) 202323105787.1





US 20260280100A1

(19) **United States**

(12) **Patent Application Publication**
Zhang et al.

(10) **Pub. No.: US 2026/0280100 A1**

(43) **Pub. Date: Sep. 17, 2026**

(54) **ANTENNA, COMMUNICATION DEVICE,
AND COMMUNICATION SYSTEM**

Publication Classification

(71) Applicant: **HUAWEI TECHNOLOGIES CO.,
LTD.**, Shenzhen (CN)

(51) **Int. Cl.**
H01Q 1/22 (2006.01)
H01Q 9/28 (2006.01)
H01Q 15/24 (2006.01)

(72) Inventors: **Xiang Zhang**, Xi'an (CN); **Chen
Zhang**, Xi'an (CN); **Xiaofeng Li**, Xi'an
(CN); **Jianghong Qin**, Xi'an (CN)

(52) **U.S. Cl.**
CPC **H01Q 1/22** (2013.01); **H01Q 9/285**
(2013.01); **H01Q 15/24** (2013.01)

(73) Assignee: **HUAWEI TECHNOLOGIES CO.,
LTD.**, Shenzhen (CN)

(57) **ABSTRACT**

(21) Appl. No.: **19/677,151**

(22) Filed: **May 14, 2026**

Related U.S. Application Data

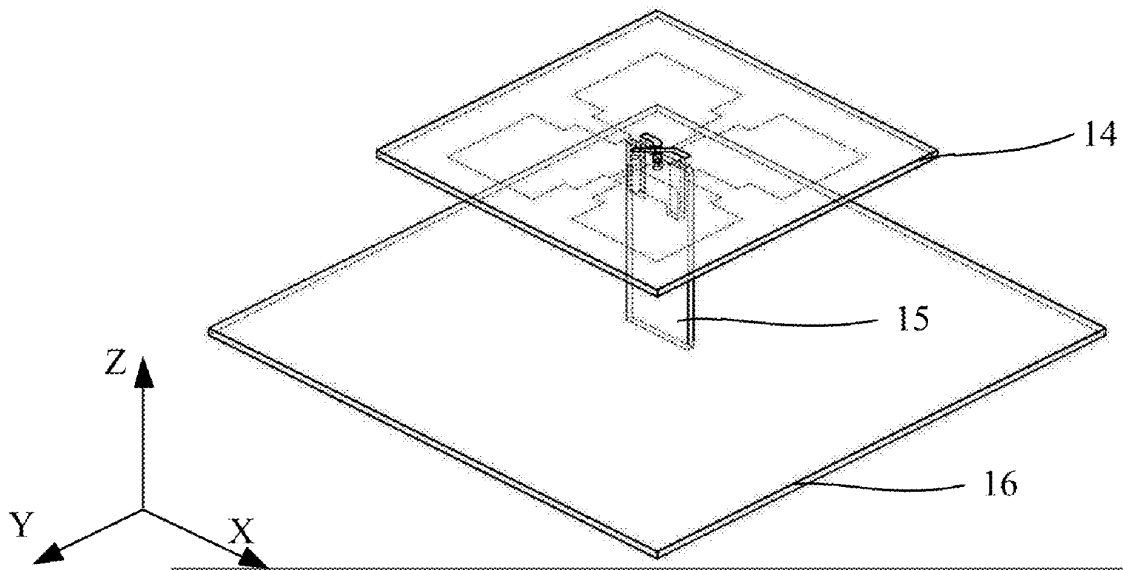
(63) Continuation of application No. PCT/CN2024/
141602, filed on Dec. 23, 2024.

(30) **Foreign Application Priority Data**

Jun. 17, 2024 (CN) 202410783223.3

An antenna includes a first polarized element, a second polarized element, and a feed network. The first polarized element includes a first radiating arm and a second radiating arm, and the second polarized element includes a third radiating arm and a fourth radiating arm. The feed network includes a first feed line circuit, a second feed line circuit, and a third feed line circuit. The first feed line circuit is feed-connected to the first polarized element, and the second feed line circuit is feed-connected to the second polarized element. The third feed line circuit is feed-connected to the first radiating arm and the third radiating arm.

10





US 20260280143A1

(19) **United States**(12) **Patent Application Publication**
Lin et al.(10) **Pub. No.: US 2026/0280143 A1**(43) **Pub. Date: Sep. 17, 2026**(54) **ANTENNA ASSEMBLY**(71) Applicant: **KYOCERA AVX Components (San Diego), Inc.**, San Diego, CA (US)(72) Inventors: **Weichun Eric Lin**, San Diego, CA (US); **Rey Anthony Aspiras Eguilos**, Perris, CA (US)(21) Appl. No.: **19/170,877**(22) Filed: **Apr. 4, 2025****Related U.S. Application Data**

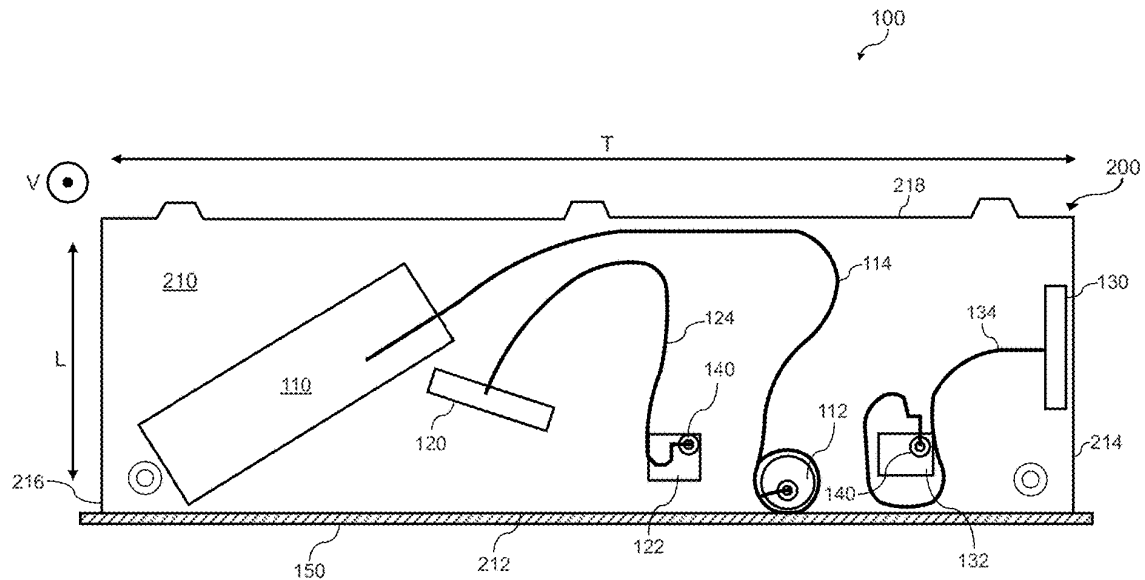
(60) Provisional application No. 63/575,246, filed on Apr. 5, 2024.

Publication Classification(51) **Int. Cl.**
H01Q 21/06 (2006.01)
H01Q 5/20 (2015.01)
H01Q 21/28 (2006.01)(52) **U.S. Cl.**CPC **H01Q 21/061** (2013.01); **H01Q 5/20** (2015.01); **H01Q 21/28** (2013.01)

(57)

ABSTRACT

An antenna assembly is provided. The antenna assembly includes a carrier having a first surface defining a reference plane, a plurality of apertures extending through the carrier, the plurality of apertures positioned along a first side of the carrier, the first side of the carrier adjacent to a second side and a third side of the carrier. The antenna assembly further includes a plurality of antennas positioned on the first surface. The antenna assembly further includes a plurality of electrical cables extending along the first surface of the carrier, each electrical cable of the plurality of electrical cables coupled to an antenna of the plurality of antennas and extending through an aperture of the plurality of apertures. A first electrical cable of the plurality of electrical cables is in contact with a conductive structure positioned along the first side of the carrier.





US 20260280150A1

(19) **United States**

(12) **Patent Application Publication**
Ma et al.

(10) **Pub. No.: US 2026/0280150 A1**

(43) **Pub. Date: Sep. 17, 2026**

(54) **ANTENNA**

Publication Classification

(71) Applicants: **BEIJING BOE SENSOR TECHNOLOGY CO., LTD.**, Beijing (CN); **BOE Technology Group Co., Ltd.**, Beijing (CN)

(51) **Int. Cl.**
H01Q 21/26 (2006.01)
H01Q 1/52 (2006.01)
H01Q 19/10 (2006.01)
H01Q 21/08 (2006.01)

(72) Inventors: **Wenxue Ma**, Beijing (CN); **Yunnan Jin**, Beijing (CN); **Sihui Bao**, Beijing (CN); **Liang Guo**, Beijing (CN)

(52) **U.S. Cl.**
CPC **H01Q 21/26** (2013.01); **H01Q 1/523** (2013.01); **H01Q 19/108** (2013.01); **H01Q 21/08** (2013.01)

(73) Assignees: **BEIJING BOE SENSOR TECHNOLOGY CO., LTD.**, Beijing (CN); **BOE Technology Group Co., Ltd.**, Beijing (CN)

(57) **ABSTRACT**

An antenna is provided. The antenna includes a plurality of radiating elements. A respective radiating element of the plurality of radiating elements includes a dielectric substrate, one or more radiating oscillators on the dielectric substrate, and one or more conductors configured to optimize polarization isolation of the antenna. The one or more conductors are spaced apart from the one or more radiating oscillators. The plurality of radiating elements are arranged along a first direction, and the one or more conductors are arranged along a direction substantially parallel to a second direction, the second direction being different from the first direction, and the first direction and the second direction intersecting each other.

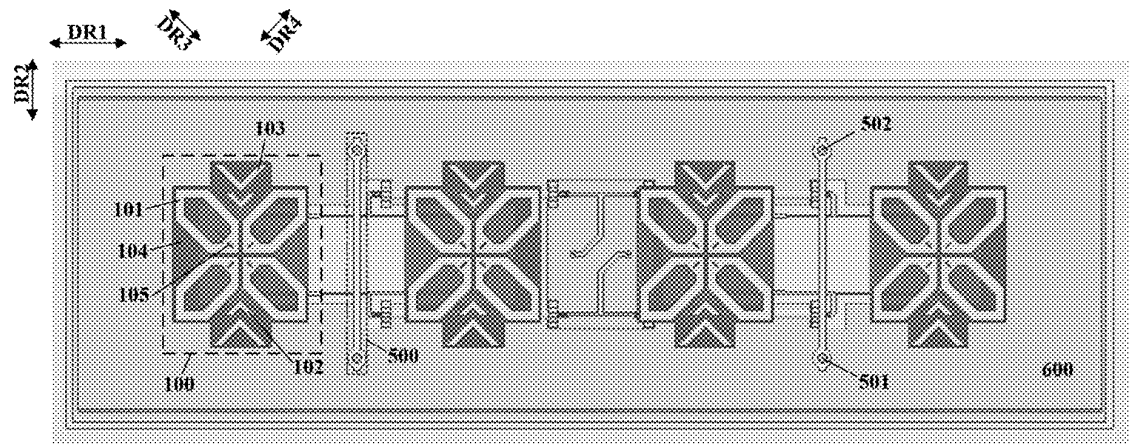
(21) Appl. No.: **19/166,170**

(22) PCT Filed: **Sep. 25, 2023**

(86) PCT No.: **PCT/CN2023/120954**

§ 371 (c)(1),

(2) Date: **Sep. 17, 2025**





US 20260280152A1

(19) **United States**

(12) **Patent Application Publication**
ZHOU et al.

(10) **Pub. No.: US 2026/0280152 A1**

(43) **Pub. Date: Sep. 17, 2026**

(54) **TERMINAL ANTENNA SYSTEM**

(71) Applicant: **HONOR DEVICE CO., LTD.**,
Shenzhen (CN)

(72) Inventors: **Dawei ZHOU**, Shenzhen (CN);
Yuanpeng Li, Shenzhen (CN)

(21) Appl. No.: **18/877,328**

(22) PCT Filed: **Nov. 14, 2023**

(86) PCT No.: **PCT/CN2023/131509**

§ 371 (c)(1),

(2) Date: **Dec. 20, 2024**

(30) **Foreign Application Priority Data**

Jan. 13, 2023 (CN) 202310083904.4

Publication Classification

(51) **Int. Cl.**

H01Q 21/28 (2006.01)

H01Q 1/24 (2006.01)

H01Q 9/42 (2006.01)

H01Q 21/00 (2006.01)

(52) **U.S. Cl.**

CPC **H01Q 21/28** (2013.01); **H01Q 1/243**

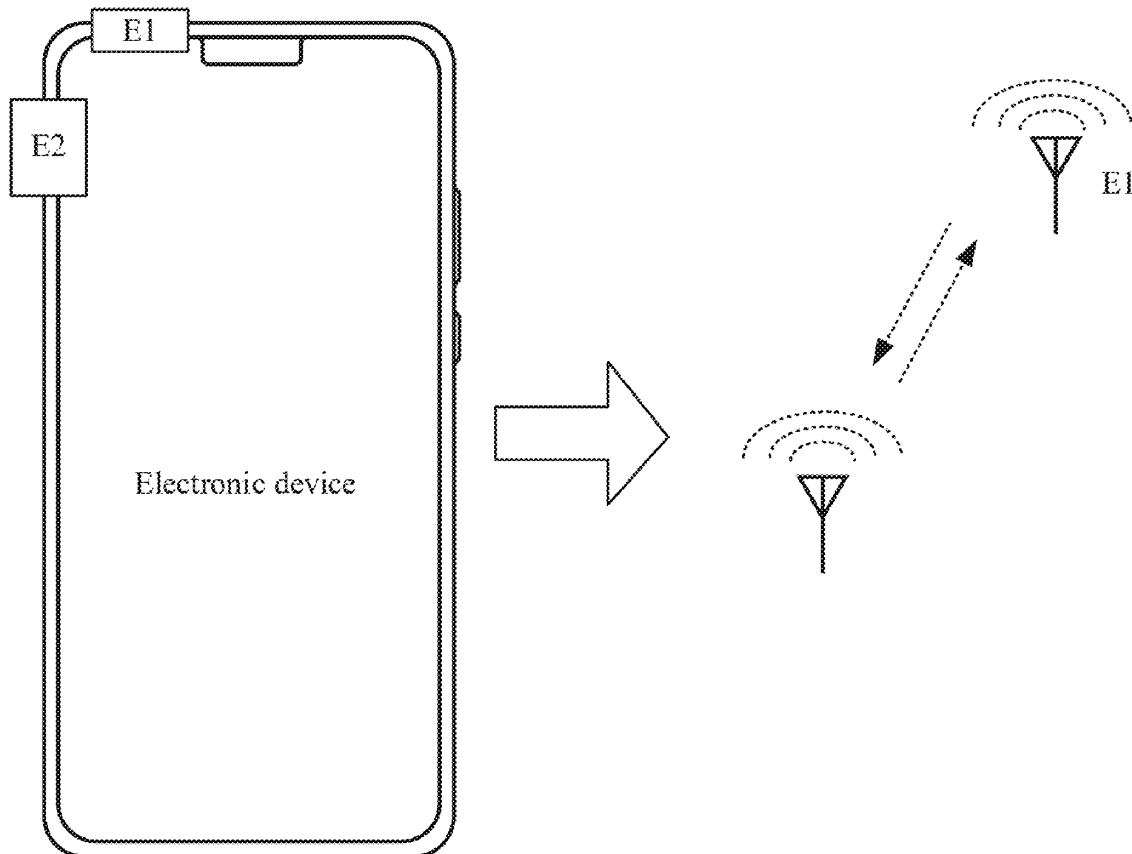
(2013.01); **H01Q 9/42** (2013.01); **H01Q**

21/0006 (2013.01)

(57)

ABSTRACT

Embodiments of this application disclose a terminal antenna system. The first antenna includes a first radiator, the second antenna includes a second radiator, and lengths of the first radiator and the second radiator are less than or equal to one-half of a wavelength corresponding to a first frequency band. A first feed point and a second feed point are respectively arranged at two ends of the first radiator and are respectively coupled to two signal output ends of a common mode feed structure. The two signal output ends have a same polarity. Two signals are equi-amplitude in-phase signals. A third feed point and a fourth feed point are arranged at two ends of the second radiator and are respectively coupled to two signal output ends of a differential mode feed structure. The two signal output ends have different polarities. Two signals are equi-amplitude phase-inverted signals.





US 20260280588A1

(19) **United States**

(12) **Patent Application Publication**
Chen et al.

(10) **Pub. No.: US 2026/0280588 A1**

(43) **Pub. Date: Sep. 17, 2026**

(54) **ANTENNA SWITCHING SYSTEM FOR
CONNECTING ANTENNA ELEMENTS TO
FORM COMBINED ANTENNAS**

(52) **U.S. Cl.**
CPC **H04B 1/0064** (2013.01); **H01Q 1/27**
(2013.01); **H01Q 5/20** (2015.01); **H01Q 5/30**
(2015.01); **H01Q 5/50** (2015.01)

(71) Applicant: **Zebra Technologies Corporation,**
Lincolnshire, IL (US)

(57) **ABSTRACT**

(72) Inventors: **Frank Chen,** Taipei (TW); **Wei-Yu
Mu,** Taipei (TW)

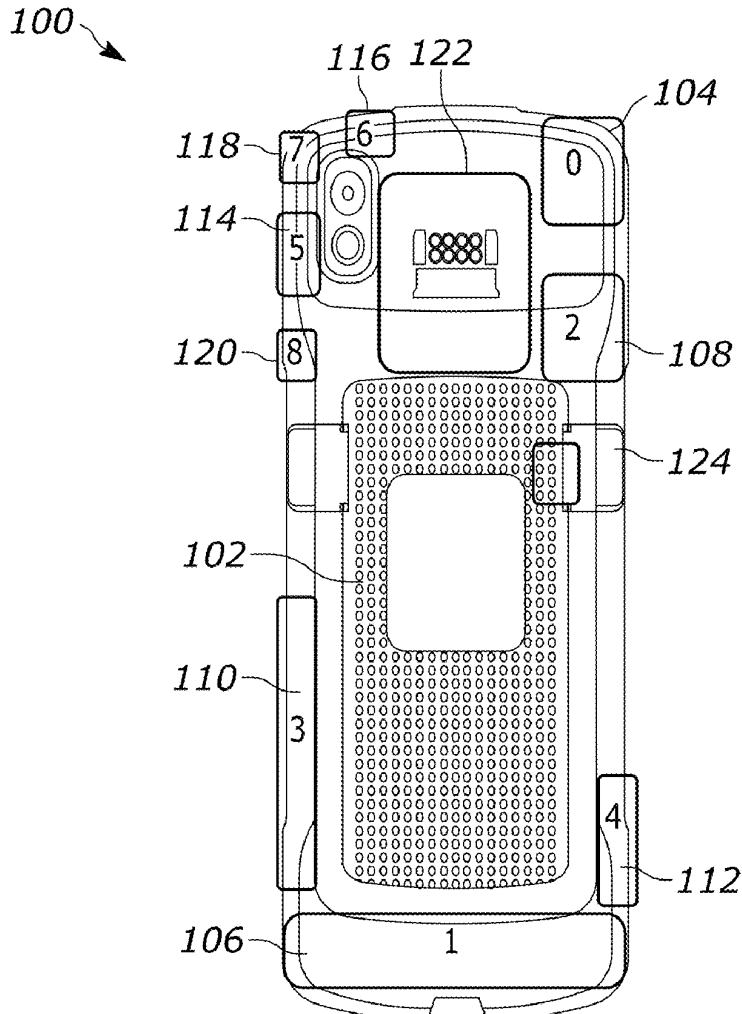
Antenna modules and switching networks are disclosed. An antenna module can include a first antenna configured to process signals in a first frequency band. The antenna module can further include a second antenna configured to process signals in a second frequency band different from the first frequency band. The antenna module can further include a switching network connected to the first antenna and the second antenna. The switching network can, in a first switching state, electrically connect the first antenna and the second antenna to form a combined antenna to process signals in a third frequency band. The switching network can further, in a second switching state, electrically disconnect the first antenna and the second antenna to process signals in the first frequency band via the first antenna and signals in the second frequency band via the second antenna.

(21) Appl. No.: **19/078,431**

(22) Filed: **Mar. 13, 2025**

Publication Classification

(51) **Int. Cl.**
H04B 1/00 (2006.01)
H01Q 1/27 (2006.01)
H01Q 5/20 (2015.01)
H01Q 5/30 (2015.01)
H01Q 5/50 (2015.01)





US 20260246137 A1

(19) **United States**
(12) **Patent Application Publication**
YOO et al.

(10) **Pub. No.:** **US 2026/0246137 A1**
(43) **Pub. Date:** **Aug. 20, 2026**

(54) **ANTENNA STRUCTURE AND ELECTRONIC
DEVICE COMPRISING SAME**

Publication Classification

(51) **Int. Cl.**

H01Q 1/22 (2006.01)
H01Q 1/02 (2006.01)
H01Q 1/42 (2006.01)
H01Q 5/30 (2015.01)

(52) **U.S. Cl.**

CPC **H01Q 1/22** (2013.01); **H01Q 1/02**
(2013.01); **H01Q 1/42** (2013.01); **H01Q**
5/30 (2015.01)

(71) Applicant: **Samsung Electronics Co., Ltd.,**
Suwon-si (KR)
(72) Inventors: **Jangsun YOO**, Suwon-si (KR);
Hakjin KIM, Suwon-si (KR); **Jihye**
MOON, Suwon-si (KR);
Youngheon SONG, Suwon-si (KR);
Myeonggil LEE, Suwon-si (KR);
Gun LIM, Suwon-si (KR);
Gwanghyun JO, Suwon-si (KR)

(21) Appl. No.: **19/641,096**

(22) Filed: **Apr. 7, 2026**

Related U.S. Application Data

(63) Continuation of application No. PCT/KR2024/096429,
filed on Oct. 30, 2024.

(30) **Foreign Application Priority Data**

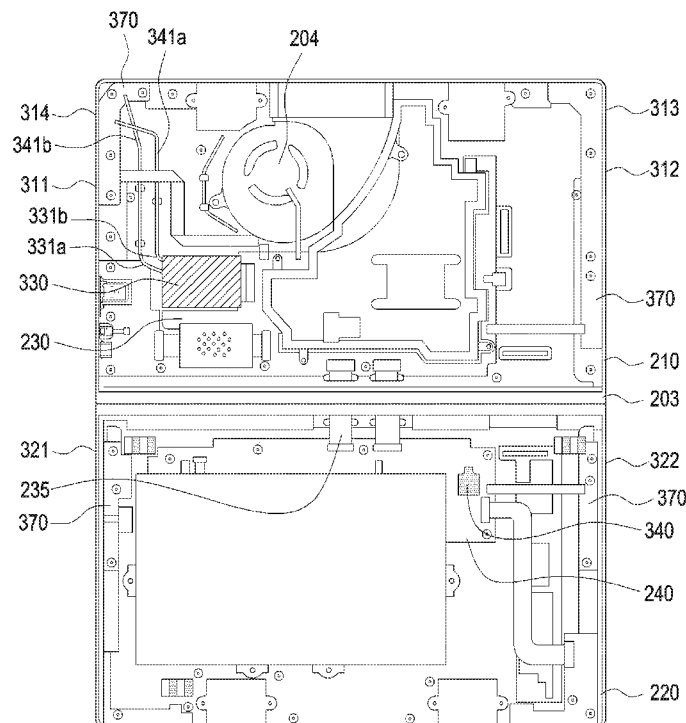
Oct. 30, 2023 (KR) 10-2023-0146492

Dec. 11, 2023 (KR) 10-2023-0179061

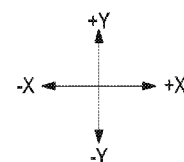
(57)

ABSTRACT

An electronic device is provided. The electronic device includes a first housing including at least one first conductive portion segmented along at least a portion of a side surface of the first housing, an antenna carrier including a first antenna pattern electrically connected to the first conductive portion, a fan disposed in the first housing, and a first printed circuit board disposed in the first housing, the first printed circuit board including a first communication module electrically connected to the first conductive portion, wherein the antenna carrier further includes a first vent hole in at least a portion of the side surface of the antenna carrier, and a feeding portion disposed on the first antenna pattern, the feeding portion configured to electrically connect to the first printed circuit board.



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314 } 320 { 321
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US 20260246140A1

(19) **United States**

(12) **Patent Application Publication**
Liu

(10) **Pub. No.: US 2026/0246140 A1**

(43) **Pub. Date: Aug. 20, 2026**

(54) **ANTENNA DEVICE INCLUDING COVERING LAYER**

(71) Applicant: **MEDIATEK INC.**, Hsinchu City (TW)

(72) Inventor: **Nai-Chen Liu**, Hsinchu City (TW)

(73) Assignee: **MEDIATEK INC.**, Hsinchu City (TW)

(21) Appl. No.: **19/263,524**

(22) Filed: **Jul. 9, 2025**

Related U.S. Application Data

(60) Provisional application No. 63/759,218, filed on Feb. 16, 2025.

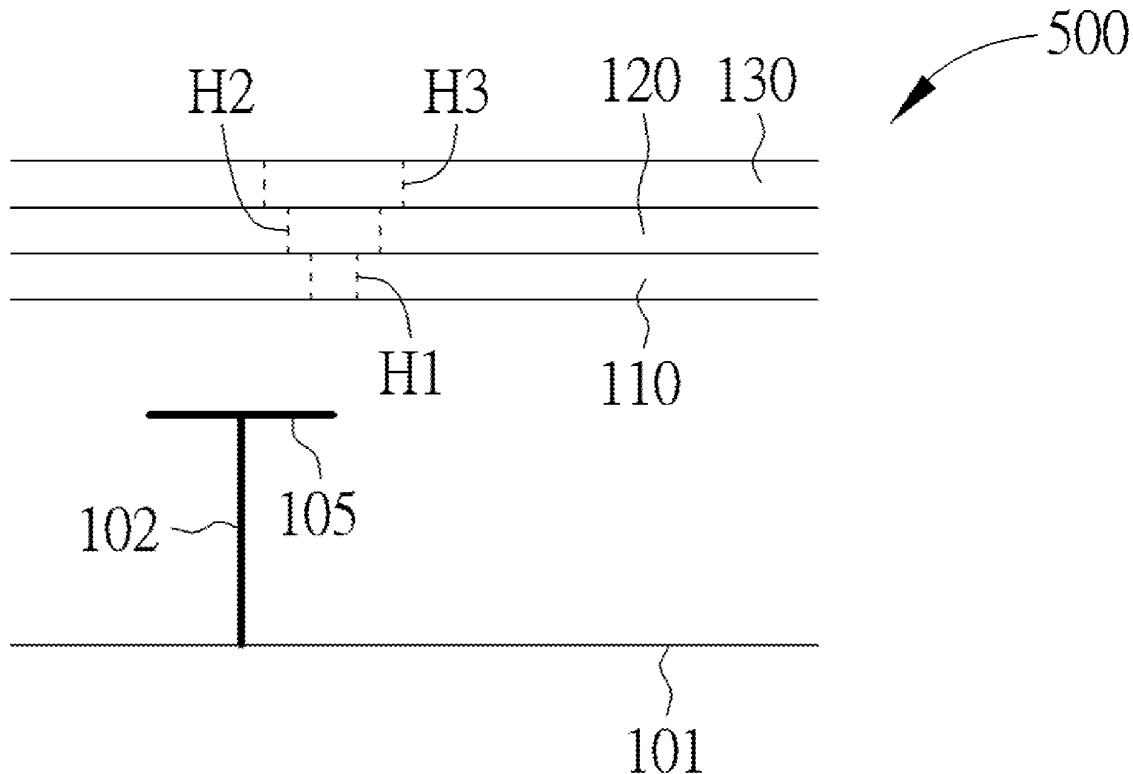
Publication Classification

(51) **Int. Cl.**
H01Q 1/42 (2006.01)

(52) **U.S. Cl.**
CPC **H01Q 1/42** (2013.01)

(57) **ABSTRACT**

An antenna device includes an antenna radiator and a covering layer. The antenna radiator is used to transmit a wireless signal. The covering layer is formed above the antenna radiator. The wireless signal is transmitted through at least the covering layer. The antenna radiator and the covering layer are separated by a predetermined distance, and the predetermined distance is less than $\frac{1}{10}$ of a wavelength of the wireless signal. The covering layer can have a hole, and a portion of an orthogonal projection of an edge of the antenna radiator can pass through the hole in a top view.





US 20260246148A1

(19) **United States**

(12) **Patent Application Publication**
KHAN et al.

(10) **Pub. No.: US 2026/0246148 A1**

(43) **Pub. Date: Aug. 20, 2026**

(54) **WIDEBAND OMNIDIRECTIONAL SLEEVE
DIPOLE ANTENNA**

Publication Classification

(71) Applicant: **TE Connectivity Solutions GmbH**,
Schaffhausen (CH)

(51) **Int. Cl.**
H01Q 9/28 (2006.01)
H01Q 1/24 (2006.01)
H01Q 1/38 (2006.01)

(72) Inventors: **Rizwan KHAN**, Penang (MY);
KokJiunn NG, Penang (MY); **Enchi
LEE**, Penang (MY); **Chin Shen TAN**,
Penang (MY)

(52) **U.S. Cl.**
CPC *H01Q 9/285* (2013.01); *H01Q 1/241*
(2013.01); *H01Q 1/38* (2013.01)

(21) Appl. No.: **19/218,704**

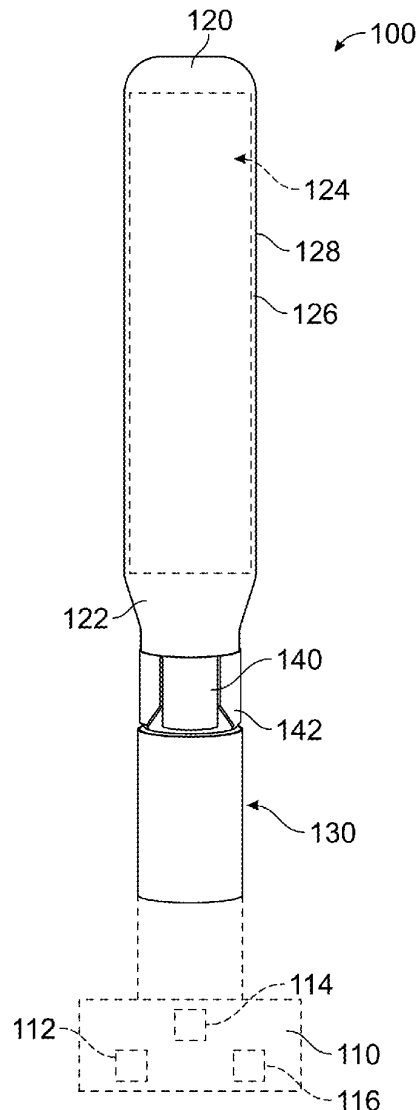
(22) Filed: **May 27, 2025**

(30) **Foreign Application Priority Data**

Feb. 17, 2025 (MY) PI 2025001125

(57) **ABSTRACT**

An antenna includes a printed circuit board and an omnidi-
rectional, multiband dipole antenna printed on a surface of
the printed circuit board. The antenna may include one or
more planar choke sleeves printed on the surface of the
printed circuit board. The dipole antenna may be a triband
antenna or a quadband antenna operable in the 2.4 GHz Wifi
band, the 5 GHz Wifi band, and the 6 GHz Wifi band.





US 20260246161 A1

(19) **United States**
(12) **Patent Application Publication**
USHIKOSHI et al.

(10) **Pub. No.:** **US 2026/0246161 A1**
(43) **Pub. Date:** **Aug. 20, 2026**

(54) **ANTENNA DEVICE**

Publication Classification

(71) Applicant: **DENSO CORPORATION**, Kariya-city (JP)

(51) **Int. Cl.**
H01Q 21/29 (2006.01)
H01Q 9/04 (2006.01)

(72) Inventors: **Daiju USHIKOSHI**, Nisshin-city (JP); **Takuya YAMASHITA**, Kariya-city (JP); **Shiro KOIDE**, Kariya-city (JP)

(52) **U.S. Cl.**
CPC **H01Q 21/29** (2013.01); **H01Q 9/0407** (2013.01)

(21) Appl. No.: **19/641,969**

(57) **ABSTRACT**

(22) Filed: **Apr. 8, 2026**

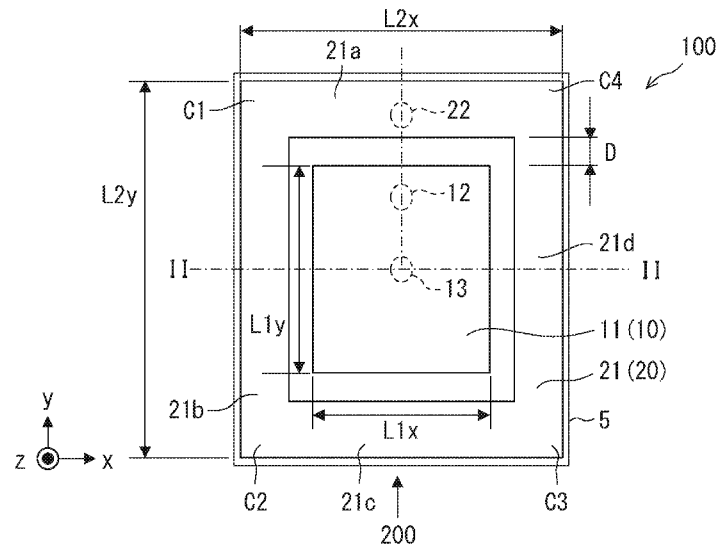
An antenna device includes a baseplate, a first antenna configured to operate as a zero-order resonant antenna including a first conductor and a short-circuit element, a second antenna including a second conductor that is arranged to surround the first conductor, and a switching unit configured to switch an antenna to be operated between the first antenna and the second antenna. The second antenna is configured to operate in a same frequency band as the first antenna.

Related U.S. Application Data

(63) Continuation of application No. PCT/JP2024/036226, filed on Oct. 10, 2024.

(30) **Foreign Application Priority Data**

Oct. 30, 2023 (JP) 2023-185928





US 20260246860A1

(19) **United States**

(12) **Patent Application Publication**
Ying et al.

(10) **Pub. No.: US 2026/0246860 A1**

(43) **Pub. Date: Aug. 20, 2026**

(54) **FOLDABLE ELECTRONIC DEVICE**

Publication Classification

(71) Applicant: **HUAWEI TECHNOLOGIES CO., LTD.**, Shenzhen (CN)

(51) **Int. Cl.**
H04M 1/02 (2006.01)
H04B 1/00 (2006.01)

(72) Inventors: **Lijun Ying**, Shanghai (CN); **Liang Xue**, Shanghai (CN); **Dong Yu**, Shanghai (CN); **Hanyang Wang**, Reading (GB)

(52) **U.S. Cl.**
CPC **H04M 1/0206** (2013.01); **H04B 1/0064** (2013.01)

(73) Assignee: **HUAWEI TECHNOLOGIES CO., LTD.**, Shenzhen (CN)

(21) Appl. No.: **19/647,243**

(22) Filed: **Apr. 14, 2026**

Related U.S. Application Data

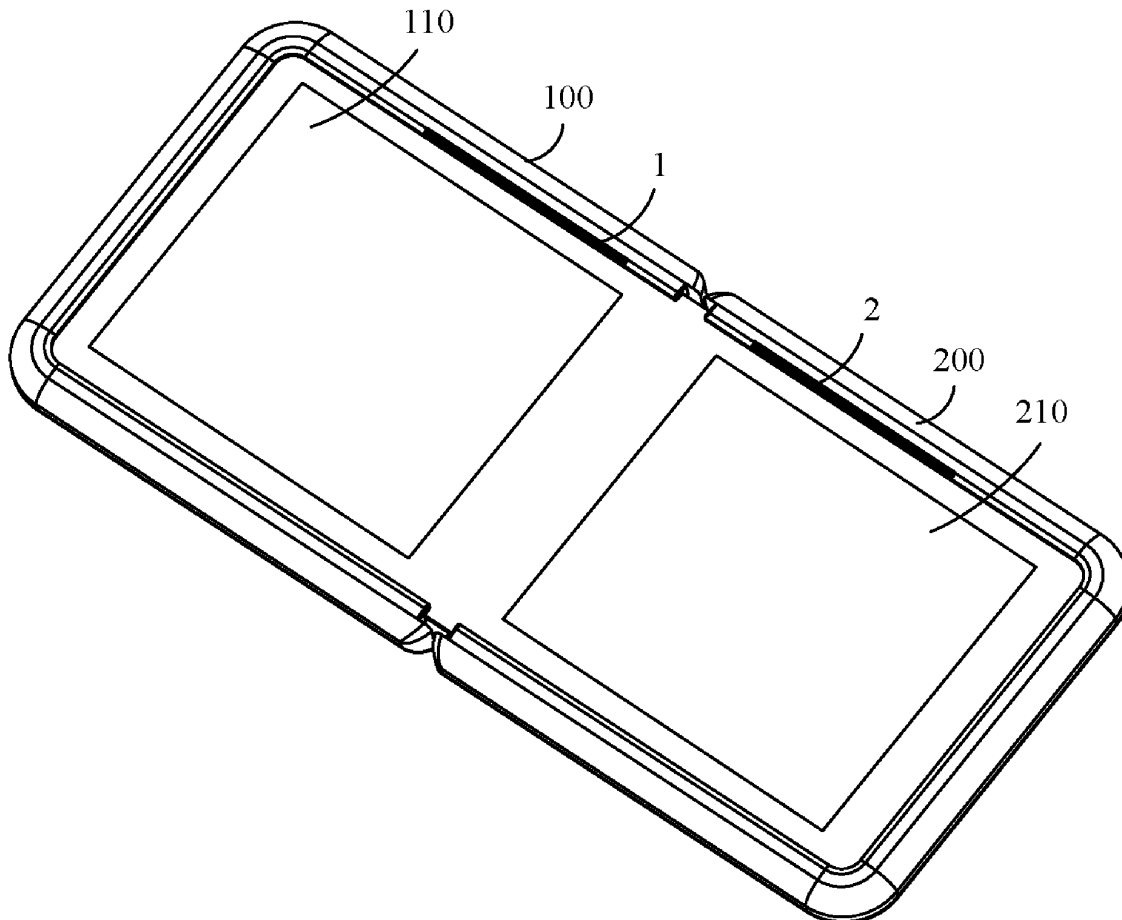
(63) Continuation of application No. PCT/CN2024/118711, filed on Sep. 13, 2024.

Foreign Application Priority Data

Dec. 25, 2023 (CN) 202311811542.2

(57) **ABSTRACT**

Example foldable electronic devices are provided. An example foldable electronic device includes an antenna apparatus including a first radiator, a second radiator, a first feeding circuit, a second feeding circuit, and a first tuning circuit. A length of the second radiator between a third open end and a second open end is greater than a length of the first radiator between a ground end and a first open end. When the electronic device is in a folded state, projections of the first open end and the second open end at least partially overlap, and a projection of the ground end is located between a first ground point and the second open end. The first tuning circuit is configured to adjust a second operating frequency band to be the same as or adjacent to a first operating frequency band.





US 20260246862 A1

(19) **United States**
(12) **Patent Application Publication**
PARK et al.

(10) **Pub. No.:** **US 2026/0246862 A1**
(43) **Pub. Date:** **Aug. 20, 2026**

(54) **FOLDABLE ELECTRONIC DEVICE COMPRISING ANTENNA MODULE**

Publication Classification

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

(51) **Int. Cl.**
H04M 1/02 (2006.01)
H01Q 1/24 (2006.01)
H01Q 1/38 (2006.01)

(72) Inventors: **Jongho PARK**, Suwon-si (KR);
Minsoo KIM, Suwon-si (KR);
Yongwoon KIM, Suwon-si (KR);
Taejeong KIM, Suwon-si (KR);
Jaehyun BAE, Suwon-si (KR);
Soogyu LEE, Suwon-si (KR);
Yonggil HAN, Suwon-si (KR)

(52) **U.S. Cl.**
CPC **H04M 1/0268** (2013.01); **H01Q 1/243**
(2013.01); **H01Q 1/38** (2013.01); **H04M**
1/0216 (2013.01); **H04M 1/0277**
(2013.01)

(21) Appl. No.: **19/640,885**

(22) Filed: **Apr. 7, 2026**

Related U.S. Application Data

(63) Continuation of application No. PCT/KR2024/011633,
filed on Aug. 7, 2024.

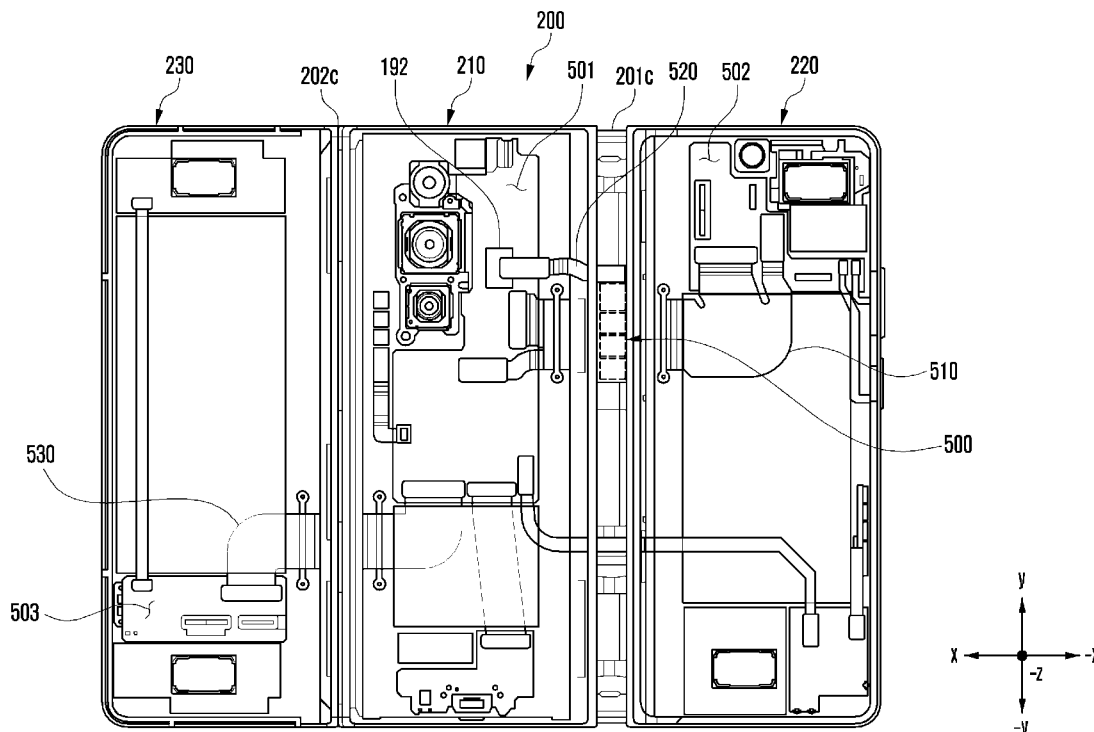
Foreign Application Priority Data

Nov. 1, 2023 (KR) 10-2023-0148960

Dec. 27, 2023 (KR) 10-2023-0192199

(57) **ABSTRACT**

A foldable electronic device is provided. The foldable electronic device includes a first housing, a second housing, a first hinge disposed between the first housing and the second housing, a flexible display disposed on the first housing and the second housing, a first hinge cover configured to cover the first hinge, a first flexible printed circuit board disposed between the first hinge and the first hinge cover, and an antenna including a plurality of patch antennas and disposed between the first flexible printed circuit board and the first hinge cover.





US 20260254096 A1

(19) **United States**
(12) **Patent Application Publication**
TSAI

(10) **Pub. No.:** **US 2026/0254096 A1**
(43) **Pub. Date:** **Aug. 27, 2026**

(54) **ELECTRONIC DEVICE**

Publication Classification

(71) Applicant: **Getac Technology Corporation,**
New Taipei City (TW)

(72) Inventor: **Ying-Chieh TSAI,** Taipei City
(TW)

(21) Appl. No.: **19/220,829**

(22) Filed: **May 28, 2025**

(51) **Int. Cl.**

H01Q 1/22 (2006.01)

H05K 1/02 (2006.01)

H05K 1/14 (2006.01)

(52) **U.S. Cl.**

CPC **H01Q 1/22** (2013.01); **H05K 1/0243**
(2013.01); **H05K 1/144** (2013.01); **H05K**
2201/041 (2013.01); **H05K 2201/10098**
(2013.01)

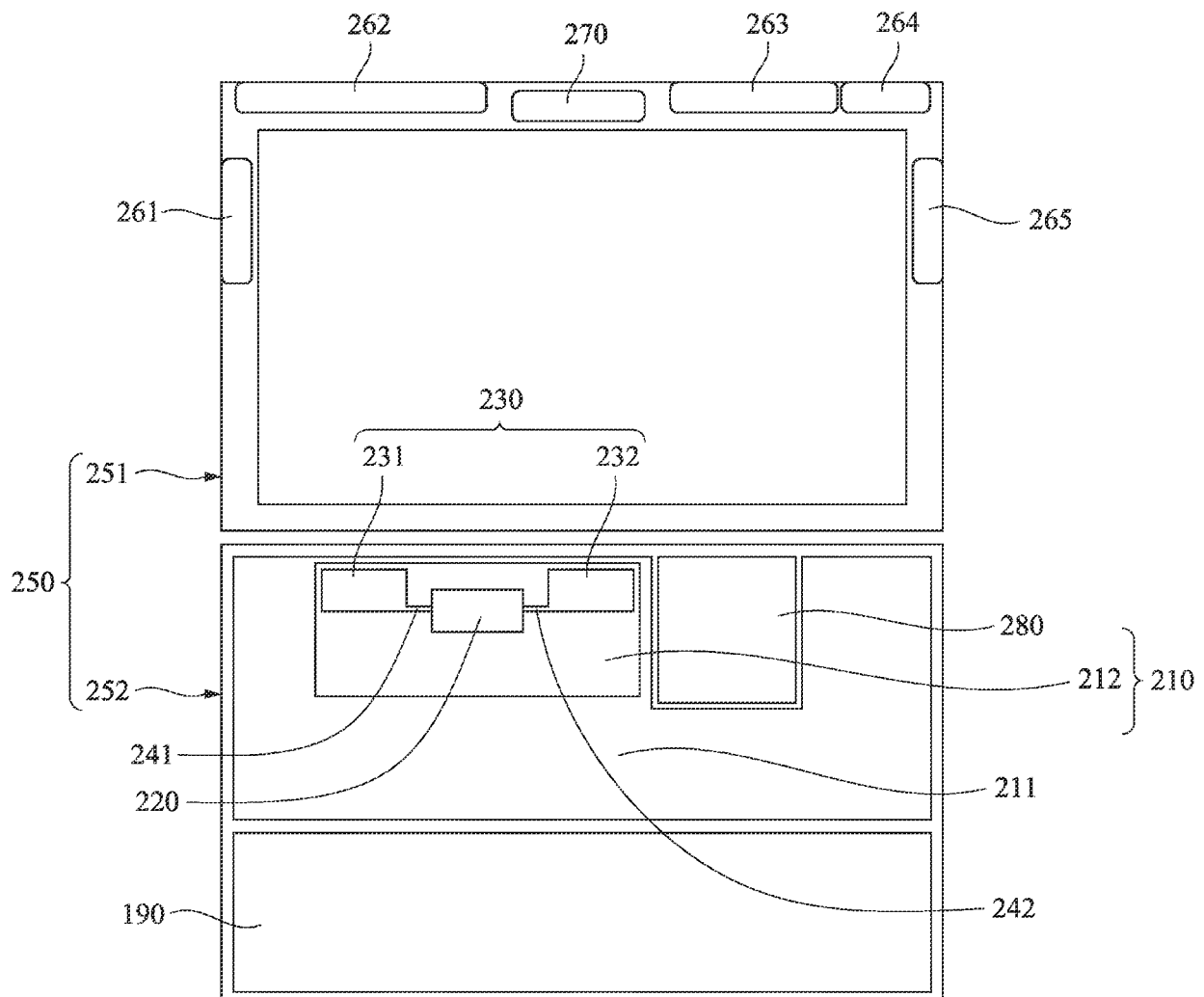
(30) **Foreign Application Priority Data**

Feb. 21, 2025 (CN) 202510195238.2

(57)

ABSTRACT

The present disclosure provides an electronic device, which includes a circuit board and an antenna signal processing device. A metal layer of an upper surface of the circuit board forms at least one printed antenna. The antenna signal processing device is mounted on the circuit board. The antenna signal processing device is electrically connected to the at least one printed antenna through the circuit board.





US 20260254097 A1

(19) **United States**
(12) **Patent Application Publication**
LO

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(54) **ANTENNA MODULE AND MANUFACTURING METHOD OF DISPLAY DEVICE HAVING THE ANTENNA MODULE**

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(57)

ABSTRACT

An antenna module includes multiple frame sections and at least one antenna structure. The antenna structure is connected with the frame sections. The antenna structure is located at a corner of the antenna module and includes at least three branches, and the branches extend along a first direction, a second direction, and a third direction that form the corner.

10

